

Eye Examination Findings Among Youths Aged 12-17 Years United States

Eye examination findings and medical history of eye conditions, wearing and need for glasses among youths in relation to vision test results and by race, geographic region, and family income.

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COOPERATION OF THE BUREAU OF THE CENSUS

In accordance with specifications established by the National Center for Health Statistics, the Bureau of the Census, under a contractual agreement, participated in the design and selection of the sample, and carried out the first stage of the field interviewing and certain parts of the statistical processing.

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EYE EXAMINATION FINDINGS AMONG YOUTHS 12-17 YEARS

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INTRODUCTION

This report contains eye examination findings with their relation to vision test results and medical histories of eye conditions among youths 12-17 years of age in the noninstitutionalized population of the United States, as estimated from the Health Examination Survey findings of 1966-70. Differentials in these findings with respect to age, sex, race, geographic region, and annual family income are shown.

The Health Examination Survey is one of the major programs of the National Center for Health Statistics, authorized under the National Health Survey Act of 1956 by the 84th Congress as a continuing Public Health Service function to determine the health status of the population.

To carry out the intent of the National Health Survey three different types of survey programs are used.¹ The Health Interview Survey, which collects health information from samples of people by household interview, is focused primarily on the impact of illness and disability within various population groups. The Health Resources programs obtain health data as well as health resource and utilization information through surveys of hospitals, nursing homes and other resident institutions, and the entire range of personnel in the health occupations. The Health Examination Survey collects health data by direct physical examination, tests, and measurements performed on samples of the population. This latter program provides the most efficient and economical way of obtaining actual diagnostic data on the prevalence of medically defined illnesses. It is the

only effective survey method for securing information on unrecognized and undiagnosed conditions and on a variety of physical, physiological, and psychological measures within the population. In addition it collects demographic and socioeconomic data on the sample population under study to which the examination findings for these persons can be related.

The Health Examination Survey is organized as a series of separate programs, or cycles, each of which is limited to some specific segment of the U.S. population and to specific aspects of health. From the first program in 1960-62, the prevalence of certain chronic diseases and the distribution of various physical and physiological measures were determined on a cross-section of the defined adult population as previously described.^{2,3}

The target population for the second cycle in 1963-65 was the Nation's noninstitutionalized children 6-11 years of age. For this program the examination focused primarily on health factors related to growth and development as described in an earlier report.⁴

For the third cycle, on which findings in this report are primarily based, a probability sample of the noninstitutionalized youths 12-17 years in the United States were selected and examined. As in the preceding program among children, the study of youths was designed to obtain basic measures of growth and development as well as data on other health characteristics for this segment of the population. The questionnaires and examination content and procedures were basically similar to those in the children's pro-

DATA SOURCES

gram, so as to obtain comparable information for the entire continuum of childhood through adolescence to young adulthood. Additional data were also obtained through the examination and histories specifically related to adolescent health. Included were a physical examination given by a pediatrician assisted by a nurse, an examination by a dentist, tests administered by a psychologist, and a variety of tests and measurements by laboratory X-ray technicians. The survey plan, sample design, examination content, and operation of the survey program have been described in a previous report.⁵

Field data collection operations for the youth's cycle started in March 1966 and were completed in March 1970. Of the 7,514 youths selected in the sample for this program, 6,768 (90 percent) were examined. This national sample is representative, and the examined group closely so, of the 22.7 million noninstitutionalized youths age 12-17 years in the United States with respect to age, sex, race, geographic region, population size of place of residence, and rate of change in size of place of residence from 1950 to 1960.

As in the preceding program among children, examinations in the youth's program were carried out consecutively in 40 different locations throughout the United States. Each youth was given a standardized examination by the examining team in the mobile units specially designed for use in the survey. Prior to the examination, demographic and socioeconomic data on household members as well as medical history, behavioral, and related data on the youth to be examined were obtained from his parents. In addition, a Health Habits and History form was completed by the youth before he arrived for the examination, and a Health Behavior form was completed by him while in the examination center. Ancillary data, requested from the school attended by the youth, included his grade placement, teacher's ratings of his behavior and adjustment, and health problems known to his teacher. For each youth, a birth certificate was obtained to verify his age and provide information related to his condition at birth.

Statistical notes on the sample design, reliability of the data, and sampling and measurement error are included in appendix I. Demographic and socioeconomic term definitions are in appendix II.

Eye Examination

The eye examination and the vision test battery for the youths were developed with the advice of Dr. J. Theodore Schwartz, ophthalmologist, now with the National Eye Institute, and Dr. Herbert A. Urweider, ophthalmologist, George Washington University School of Medicine.

Each youth was given an eye examination by the survey staff pediatrician. This included a careful, general inspection for evidence of abnormal conditions of the lids, conjunctivae, sclerae, pupils, and irides; a cover test to detect the presence of tropia (manifest strabismus), lateral phoria, and other abnormal conditions of the extraocular muscles; an inspection of the conjugate gaze; and a determination of the focusing or dominant eye (appendix III).

Vision Tests

The vision tests included those to detect and classify color vision deficiencies, both monocular and binocular tests to determine the level of distance and near central visual acuity, tests of lateral phoria at distance and near, trial lens tests giving a crude determination of the presence and severity of myopia at distance for those scoring less than 20/20 (Snellen) at distance, and lensometer measurements of the correction in the refractive lenses worn by the examinee. All tests except color vision were done without correction. For those who had their glasses or contact lenses with them, tests at distance were also done with their usual correction.

These tests were performed by the survey examining dentists who had been specially trained in their administration by Dr. Urweider.

Testing of phoria and visual acuity was done with the same targets and type of instrument, the Master Ortho-Rater, as in the children's study to maintain comparability across the entire 6-17 year age range. The design of the instruments, the limitations of the instruments in visual acuity testing, and the specially constructed targets used are described in the report *Visual Acuity of Youths 12-17 Years*.⁶ The standard targets used for phoria testing, the trial lens test for myopia, and the lensometer measurements are described in

the report *Refraction Status of Youths 12-17 Years*.⁷

Medical Histories

Parent questionnaire.—At the time of the initial visit to the sample household, the census interviewer left a Medical History of Youth form with the parent or guardian to be completed for each eligible youth.

A few days later the Health Examination Survey representative (HER) visited the household and reviewed the self-administered medical history for completeness and consistency. If the form was not completed or only partially so, the HER attempted, with the parent's help, to complete it at that time.

The history form included three questions concerning whether the youth wore or needed glasses and whether or not he or she had ever had any other eye trouble or an eye operation (appendix III).

Youth questionnaire.—At the time of the HER's visit to the household, she left a Health Habits and History form with instructions that it be completed by the eligible youth and returned to the survey in the envelope provided before the youth arrived for the scheduled examination.

This history form contained questions relating to the necessity for glasses, the occasions when they were worn, and any other eye problem that the youth may have (appendix III).

The staff pediatrician reviewed both medical histories in advance of the examination and administered some further special examinations in those instances where either the medical history or his initial examination made him suspect the presence of an eye defect.

School questionnaire.—At the time sample youths were picked up or returned to the schools, the escorts left a Supplemental Information From School form, for each sample youth in the school, with the school principal, who had been asked to have each form completed by the youth's teacher or whoever he believed would be the best informed respondent. In locations visited during the summer months when school was not in session, the questionnaires were mailed to the school in the early fall with a request that they be completed and returned.

The school questionnaire included a question regarding the youth's need for and use of special facilities for the visually handicapped (appendix III).

FINDINGS

In this report, the prevalence of the examination findings are shown in rates per 1,000 youths to preserve some meaningful measure for the rarer conditions identified; while findings from the medical history items and related material on vision where the proportions affected are substantially greater are given in rates per 100, similar to the report on Eye Examination Findings Among Children.⁸

Eye Conditions

Nearly one-twelfth (79.2 per 1,000 youths) or an estimated 1.8 million of the 22.7 million youths age 12-17 years in the civilian noninstitutionalized population of the United States have one or more significant eye abnormalities—tropia or other extraocular muscle abnormalities; acute or chronic conditions of the lids, conjunctivae, sclerae, pupils, or irides; or other types of eye abnormalities (table 1). These national estimates are based on the eye examination findings of the pediatricians in the Health Examination Survey among a national probability sample representative of noninstitutionalized youths in 1966-70.

The prevalence rate for these eye conditions decreases slightly with age from 81.8 per 1,000 at 12 years to 64.8 per 1,000 at 15 years then rises to 90.0 by age 17 years (figure 1). Boys are substantially more likely than girls of this age to have such conditions. The difference in rates for the 12-17 year age range—89.3 per 1,000 among boys compared with 68.8 per 1,000 among girls—exceeds the 95-percent confidence limit for such estimates (i.e., is statistically significant at the 5-percent probability level). Across the entire 12-17 year age range the rates for boys consistently exceed those for girls and the decrease with age to 15 years is consistent only among the girls (figure 2).

Eye abnormalities are substantially less prevalent among U.S. youths from the present study than among U.S. children 6-11 years of age based on findings from the 1963-65 Health Exam-

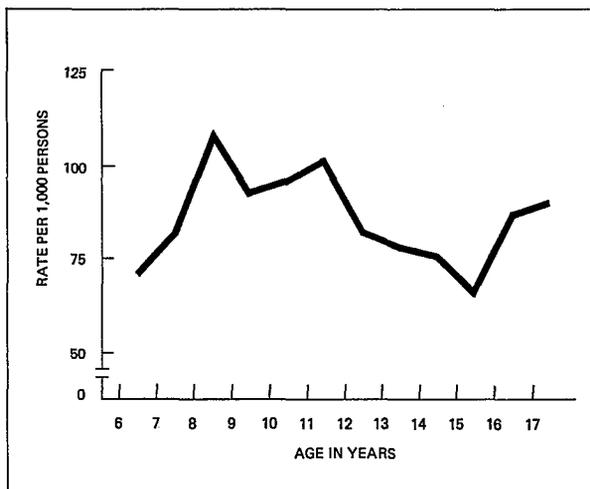


Figure 1. Prevalence rates for abnormal findings from eye examinations of children and youths 6-17 years by age: United States, 1963-70.

ination Survey in which a similar type of eye examination was given—79.2 per 1,000 youths compared with 91.8 per 1,000 children.⁸ Except at ages 6 and 7 years, the prevalence rates for eye conditions were consistently higher among children than youths at each year of age (figure 1). Across the age range 11-17 years boys were consistently more likely than girls to have such conditions, while among younger children 6-10 years the reverse was consistently found (figure 2).

Information was obtained and published on eye conditions among U.S. adults in the 1960-62 Health Examination Survey.⁹ However, the purpose and type of eye examination differed from that given children and youths in the more recent surveys to the extent that the findings will not be

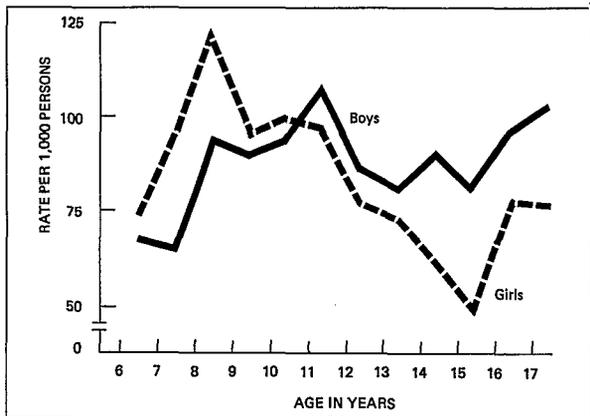


Figure 2. Prevalence rates for abnormal findings from eye examinations of boys and girls 6-17 years by age: United States, 1963-70.

comparable. The adults were given only a funduscopic examination with an ophthalmoscope to identify abnormalities of the retina commonly associated with elevated blood pressure and certain other eye conditions that tend to increase with age such as venous engorgement, lens opacities including cataracts, other disc abnormalities, and iritis. It included no tests to detect eye muscle abnormalities. Among the youngest group of adults age 18-24 years from this first Health Examination Survey the prevalence of eye conditions was nearly 60 per 1,000 or substantially less than the rates of 92 per 1,000 children and 79 per 1,000 youths. However, if the eye muscle problems are removed from the findings among the two younger age groups to be more nearly consistent with those from the earliest national study among adults, the prevalence rates among children and youths would both be reduced to slightly less than 40 per 1,000 or just slightly (but not significantly) less than the rate of 60 per 1,000 young adults.

The number of specific eye conditions identified per youth from the present study averaged 1.2 or just slightly more than the 1.1 found among children.

Tropia or manifest strabismus was the most prevalent eye condition among youths, as among children. Nearly half (44 percent) of all youths with some type of eye abnormality had this problem. About one-fourth of those with any eye abnormality had one or more acute or chronic conditions of their lids, conjunctivae, or sclerae. Other types of extraocular muscle conditions (other than tropia) were identified among nearly one in five youths with eye abnormalities. These proportions were similar among boys and girls though the rates were lower among girls since relatively fewer of them had abnormal eye conditions.

Tropia.—The prevalence rate for tropia (or manifest strabismus) among U.S. youths was estimated at nearly 4 percent (34.5 per 1,000 youths) as determined in the present study (tables 1 and 4). Hence approximately 800,000 youths of this age in the country have such conditions. The rate is slightly but not significantly (statistically) greater among boys than girls of that age—38.8 per 1,000 boys compared with 30.1 per 1,000 girls.

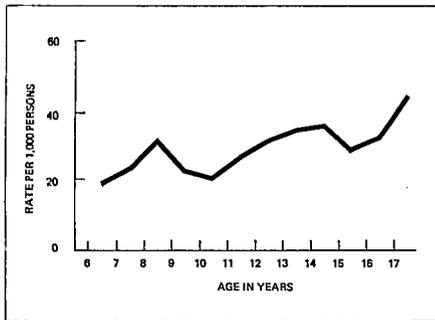


Figure 3. Prevalence rates for tropia (manifest strabismus) from eye examination findings among children and youths 6-17 years by age: United States, 1963-70.

No consistent age-related trend is evident, though for boys the prevalence is slightly higher among those 16 and 17 years old than younger boys but not girls.

The prevalence of tropia is slightly greater among youths age 12-17 years from the present study than among children 6-11 years from the 1963-65 national survey—34.5 per 1,000 youths compared with 23.8 per 1,000 children—though the difference is not large enough to be considered statistically significant (at the 5-percent probability level). Over the 6-17 year age range there is some indication of a gradual increase in prevalence with age that is slightly more consistent among boys than girls (figures 3 and 4).

Among youths, tropia was identified in the left eye nearly as frequently as in the right—20.3 per 1,000 compared with 21.0 per 1,000 (table 6). For those youths who have this condition only one eye was affected more frequently than both—80 percent only one eye, 20 percent both. The deviation in gaze tended to be outward (60 percent)

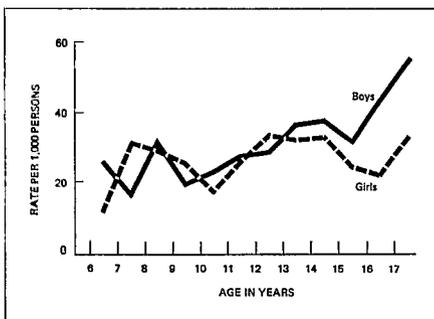


Figure 4. Prevalence rates for tropia (manifest strabismus) from eye examination findings among boys and girls 6-17 years by age: United States, 1963-70.

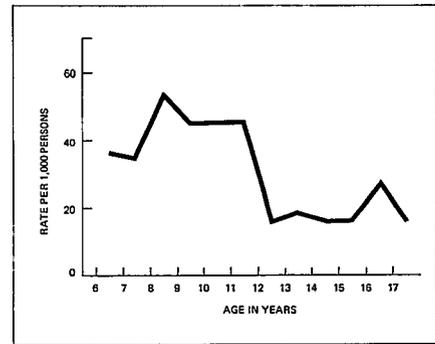


Figure 5. Prevalence rates for other extraocular muscle conditions from eye examination findings among children and youths 6-17 years by age: United States, 1963-70.

more frequently than inward (35 percent) among youths with tropia, in contrast to the findings among children with this manifest condition in the earlier national study where 47 percent had convergent and 25 percent divergent gaze.⁸

Other extraocular muscle condition.—Among youths age 12-17 years the prevalence rate for extraocular muscle conditions, other than tropia, is 18.3 per 1,000. Boys are slightly more likely than girls to have such problems—18.9 per 1,000 boys compared with 17.5 per 1,000 girls. (Tables 1 and 4.)

The prevalence rates for such conditions are at about the same level for boys and girls (18.9 and 17.5 per 1,000, respectively) and show no consistent age-related trend. These rates are minimal at age 12 years and maximal at age 16 years for both boys and girls, but only at 16 years for girls do the rates differ significantly from those at other ages in this range. (Figures 5 and 6.)

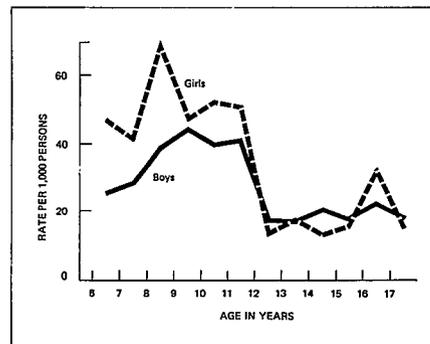


Figure 6. Prevalence rates for other extraocular muscle conditions from eye examination findings among boys and girls 6-17 years by age: United States, 1963-70.

In contrast to the findings for tropia, the prevalence of other extraocular muscle conditions among youths 12-17 years from the present study is significantly less than among children 6-11 years of age from the 1963-65 national survey—18.3 per 1,000 youths compared with 43.4 per 1,000 children. The difference in these rates between the two age groups, in the absence of any age-related trend for either, probably reflects the improved examination methods used among youths and the fact that the latter may have been more cooperative than the children in this part of the examination, rather than any actual difference in prevalence.

In the earlier examination among children all such conditions were recorded as "latent strabismus" while in the examination among youths the medical examiner specifically differentiated among conditions of latent strabismus; paralyzed, weakened, or palsied muscles; and nystagmus. As shown in table 4 and figure 7 one-third of the youths with other extraocular muscle conditions were considered to have paralyzed eye muscles (rate of 6.1 per 1,000 of all youths), slightly less than one-third had nystagmus (rate of 5.1 per 1,000 of all youths), and slightly less than one-third had latent strabismus (rate of 4.7 per 1,000 of all youths). The remainder had weakened or palsied eye muscles.

Among youths with these other extraocular muscle problems, the right eye was nearly as frequently affected as the left (12.3 for the right

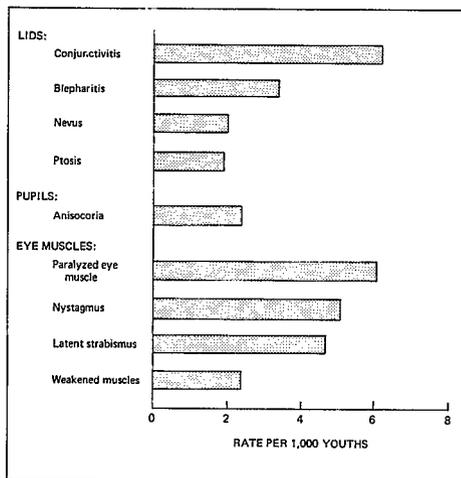


Figure 7. Prevalence rates for selected eye examination findings among youths 12-17 years: United States, 1966-70.

eye compared with 14.0 for the left eye per 1,000 youths) and both of the eyes were nearly as frequently affected as just one (47 percent compared with 53 percent of youths with such problems) (table 7).

Lids.—Acute or chronic conditions of the eyelids and adjacent skin or tissue were present in 21.4 per 1,000 youths age 12-17 years (tables 1 and 2). The prevalence rate among boys was nearly twice that among girls (26.8 per 1,000 boys compared with 15.8 per 1,000 girls). There was no consistent trend with age, the rates being just slightly higher among the youngest and oldest youths, but at each year of age boys were more likely than girls to have such conditions.

The most prevalent of these lid conditions were conjunctivitis (6.2 per 1,000 youths), blepharitis (3.4 per 1,000 youths), nevus (2.0 per 1,000 youths), and ptosis (1.9 per 1,000 youths). The prevalence rates for conditions of styes, seborrhea, hemorrhage, scars, and (open) lacerations were each less than 1.5 per 1,000 youths.

Of the three infectious or allergic conditions identified in this region among children age 6-11 years from the 1963-65 national survey, conjunctivitis was the only one more prevalent among youths age 12-17 years—the rates being 6.2 per 1,000 youths compared with 4.3 per 1,000 children. The prevalence of blepharitis decreased slightly from 4.4 per 1,000 children to 3.4 per 1,000 youths, while that for styes dropped from 2.9 per 1,000 children to 1.3 per 1,000 youths. The prevalence for each of these three conditions was greater among boys than girls 12-17 years of age in contrast to the findings among children where this occurred only with conjunctivitis.

Conditions of skin malformation (nevus) in this region, drooping of the upper lid from paralysis of the third nerve or other cause (ptosis), and excessive secretion of the sebaceous glands in the skin of the lids (seborrhea) were not identified among children in the previous examination survey.

Pupils.—Abnormalities of the pupils or irides were present in 9.6 per 1,000 youths, with the rate being slightly larger among boys than girls (11.2 per 1,000 boys, 8.0 per 1,000 girls). No trend with age is evident in these abnormalities among youths (tables 1 and 3).

The condition of the pupils or irides most frequently identified on examination of the youths was anisocoria or unequal sized pupils (rate of 2.3 per 1,000 youths). Less than 1.5 per 1,000 youths have conditions such as limbic rings (1.3 per 1,000), photosensitivity (0.9 per 1,000), depigmented iris (0.9 per 1,000), cataracts (0.8 per 1,000), with lower rates for scars, lens opacities, aphakia, slow or unreactive pupils, and other conditions.

Eye Conditions - Vision Tests

Comparison is made here between the medical examiner's findings of tropia or other extraocular muscle abnormality and results from the standard phoria and visual acuity tests given these youths. These comparisons are shown as an aid in screening programs where either a commercial instrument or simple eye inspection may be used to identify persons in need of further examination or treatment.

In the phoria tests, as described previously,⁷ a measure was obtained of the degree of misalignment between the visual axes of the two eyes in the lateral (horizontal) plane under conditions in which the stimulus to fusion (seeing one single image or binocular viewing) is low. No differentiation is made in this test between conditions of tropia (manifest strabismus) in which the youth's eyes are unable to fuse (see a single image) normally in binocular viewing and those in which the extraocular muscles are able to make such compensation.

The examining pediatrician, through trained, skilled observation, using cover and other physical tests, differentiated between conditions of tropia and other extraocular muscle abnormalities.

Phoria - examination.—An indication of the type and extent of agreement between moderate or severe heterophoria of 5 prism diopters (5^Δ) or more deviation from normal on the standard test and the examination findings of tropia or other extraocular muscle abnormalities may be seen in tables 8 and 9. Among youths with tropia, less than half (43.5 percent) showed moderate or severe heterophoria on the standard test. The proportion was slightly higher among girls than boys (46.6 percent compared with 40.7 percent) and was slightly lower among youths over 14

years of age than those who were younger (28-38 percent among those age 15-17 years compared with 47-57 percent among youths age 12-14 years).

Those youths with other extraocular muscle abnormalities, only some of which would be expected to affect binocular fusion, show somewhat lower proportions with moderate or severe heterophoria on test—38 percent with deviations of 5^Δ or more among this group compared with nearly 44 percent among youths with tropia.

The relationship between this part of the eye examination findings and the standard heterophoria test results obtained with corrective lenses (the youth's own glasses or contacts) as shown in tables 10 and 11 is similar to that found with their tests without corrective lenses.

The extent of agreement between the eye examination findings and moderate to severe heterophoria on test for youths age 12-17 years in the present national study is similar to the comparable findings among children age 6-11 years from the preceding Health Examination Survey in 1963-65. Among children age 6-11 years with tropia, 47 percent tested as having heterophoria of 5^Δ or more compared with the nearly 44 percent among youths age 12-17 years. For those with other extraocular muscle abnormalities, the proportion with at least moderate heterophoria (5^Δ or more) was slightly less among children (27 percent) than youths (38 percent) as shown in figure 8.

Phoria - acuity.—The extent to which visual acuity is associated with heterophoria test results among youths ages 12-17 years is shown for un-

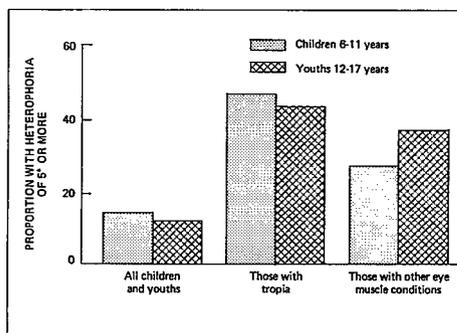


Figure 8. Proportion of children 6-11 years and youths 12-17 years with significant heterophoria on distance vision test and with tropia or other extraocular muscle conditions: United States, 1963-70.

corrected distance acuity in table 13 and for uncorrected near acuity in table 14.

Youths with visual acuity at distance of 20/20 or better include a significantly (statistically) greater proportion with moderate or severe heterophoria (5^{Δ} or more) at distance than do youths with defective visual acuity at distance or 20/40 or less. The proportions are 19 percent among those with acuity 20/20 or better compared with 10 percent among youths with defective visual acuity of 20/40 or less. Both girls and boys show this pattern, however, the proportion with this degree of heterophoria among both the visually (acuity) normal and those with defective acuity is slightly greater among girls than boys

The association of heterophoria test results with near visual acuity among youths is substantially stronger than with distance acuity. Only 12 percent of those with near acuity (uncorrected) of 14/14 or better have moderate to severe heterophoria at near (6^{Δ} or more esophoria or 10^{Δ} or more exophoria) compared with 69 percent among youths with near acuity no better than 14/35. As for tests at distance, the findings at near are similar for boys and girls, but, in contrast to the findings at distance, slightly more of the boys than the girls in both the visually normal and visually defective acuity groups have moderate to severe near heterophoria.

Comparison of these test results among youths in the present national study with those for children age 6-11 years in the previous national Health Examination Survey show that on tests at distance the proportion with at least moderate heterophoria (5^{Δ} or more) among those with acuity of 20/20 or better is slightly greater among youths than children (19.3 percent compared with 12.8 percent); while relatively fewer youths than children with defective acuity of 20/40 or less had that degree of heterophoria (24.1 percent of children compared with 10.3 percent of youths), as shown in figure 9.

At near, the proportion of youths with at least moderate heterophoria among those with near acuity of 14/14 or better is substantially lower than this proportion among children (12.1 per 100 youths compared with 24.2 per 100 children); while among those with defective near acuity of 14/35 or less the findings among both age groups

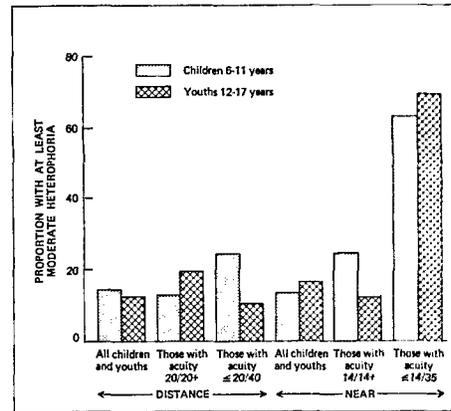


Figure 9. Proportion of children 6-11 years and youths 12-17 years with significant heterophoria on vision tests and with essentially normal or defective visual acuity at distance: United States, 1963-70.

are similar—69.0 percent of youths and 63.0 percent of children with defective near acuity have moderate or severe near heterophoria (6^{Δ} or more esophoria or 10^{Δ} or more exophoria) (figure 9).

Examination - acuity.—The prevalence of tropia among youths age 12-17 years with distance visual acuity of 20/20 or better is nearly twice that rate among youths with defective distance acuity of 20/40 or less—rates of 2 per 100 youths with at least "normal" acuity compared with 1 per 100 youths with defective acuity at distance (table 12). Similarly the prevalence of other extraocular muscle abnormalities among youths with distance acuity 20/20 or better is also about twice the rate for such conditions among youths with defective distance acuity of 20/20 or less—1.2 per 100 youths with at least "normal" acuity compared with 0.5 per 100 youths with defective acuity. These findings are consistent with those for heterophoria at distance among youths (tables 13 and 14).

Eye Conditions - Race, Region, Income

Race.—The prevalence rates for any eye abnormality, as found on examination, is slightly but not significantly greater among Negro than white youths age 12-17 years, the rates being 75.8 per 1,000 white youths compared with 103.9 per 1,000 Negro youths. This racial pattern is consistent among both boys and girls and across

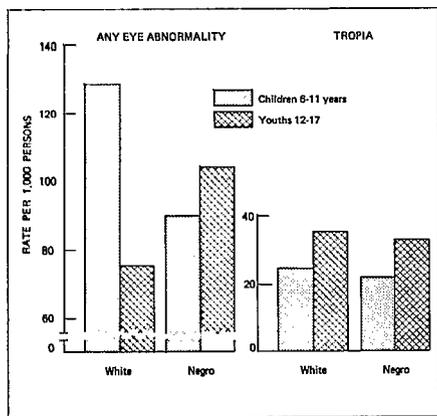


Figure 10. Prevalence rates for any abnormal findings and for tropia from eye examinations of children 6-11 years and youths 12-17 years by race: United States, 1963-70.

the 12-17 year age range, except at 14 years (table 15).

The reverse, but also nonsignificant, racial pattern was found among children age 6-11 years from the previous national Health Examination Survey in 1963-65, from which the corresponding rates were 129.0 per 1,000 white children compared with 90.2 per 1,000 Negro children. The racial pattern among children was consistent for boys and girls as well as across the entire 6-11 year age range.

Among the white population, the prevalence of eye abnormalities is slightly but not significantly greater for children than youths, while the reverse was found among the Negro population (figure 10).

Tropia was slightly, but not significantly, more prevalent among white than Negro children and youths, though this differential for the most prevalent type of eye condition among youths was not found consistently among boys and girls nor across the 6-17 year age range. In each racial group relatively more youths than children had conditions of tropia.

Region.—No consistent pattern of geographic regional differences were found in the prevalence rates for eye abnormalities among youths in the United States. Since for the purposes of this survey the country was divided into four broad heterogeneous regions, it is not possible here to detect any State or smaller area differences that may exist.

The rates for any eye abnormality were slightly higher among youths—both boys and girls—in the Midwest where the rate is 86.6 per 1,000 youths and slightly lower among those in the Northeast, 69.5 per 1,000 youths, than in either the South or West (table 16), but these regional differences were not consistent across age and were small enough to be due to sampling variability alone (with the size and design of the sample used in the present study).

In contrast among children age 6-11 years from the preceding Health Examination Survey in 1963-65 the prevalence rates for eye abnormalities were consistently highest in the West (172.5 per 1,000 children) and lowest in the South (83.6 per 1,000 children) than elsewhere among both boys and girls and across the 6-11 year age range.

Eye abnormalities were slightly less prevalent among youths age 12-17 years than children age 6-11 years in each of the four regions (figure 11). This age differential existed in each of the regions for girls and in all but the South for boys. Across the 6-17 age range from the two national surveys, however, only in the Northeast and West were the age-specific rates among the children consistently higher than those among youths.

For the most prevalent of the eye conditions identified among youths, tropia, rates were highest in the Midwest (50.6 per 1,000 youths), for all eye conditions, but at about the same level in the other three regions (26.4-28.8 per 1,000 youths). In contrast to the findings for all eye conditions, tropia was less prevalent among children 6-11 years from the previous survey than among youths 12-17 years in the present national study in three of the four regions, the only exception being the Northeast (figure 11).

The pattern of regional differences in the prevalence of any eye abnormality among white youths 12-17 years is consistent with that for all youths—the highest rates in the Midwest and the lowest in the Northeast (table 18). However, among Negro youths the prevalence of such conditions was slightly but not significantly lower in the South and higher in the West than elsewhere (table 19).

Income.—Eye abnormality rates show a consistent association with the income level of the family among youths age 12-17 years. The prevalence is highest among those in families with

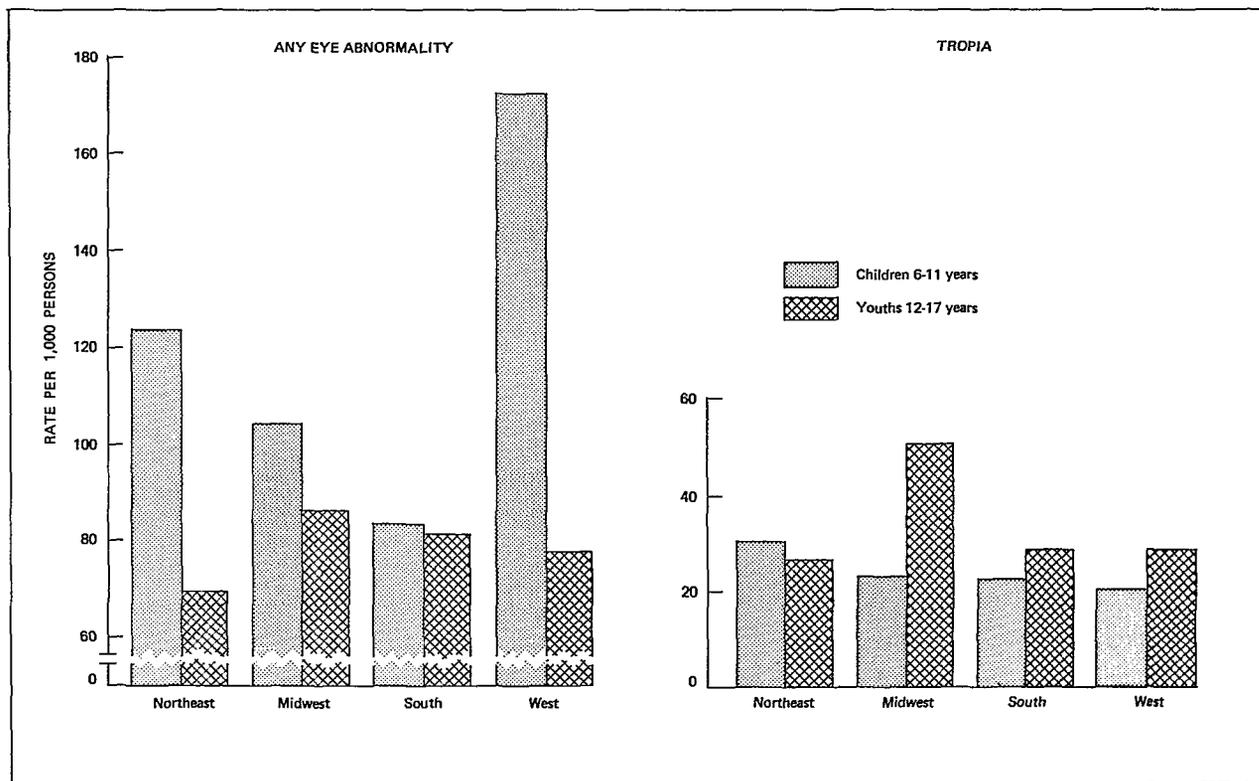


Figure 11. Prevalence rates for any abnormal findings and for tropia from eye examinations of children 6-11 years and youths 12-17 years by geographic region: United States, 1963-70.

less than \$5,000 annual income—105.7 per 1,000 youths in the below \$5,000 group compared with 69.4 and 70.0 per 1,000 youths in the income levels of \$5,000-\$9,999 and \$10,000 or more—though the difference in rates is not large enough to be statistically significant. These higher rates among youths in the lowest income level families are present among both boys and girls and are consistent across the 12-17 year age range (table 17).

Among children 6-11 years from the 1963-65 national survey, the association of these eye conditions with income is somewhat less consistent than among youths. For the entire 6-11 year age group, eye abnormality rates were highest among those in the lowest income level families—133.4 per 1,000 children where family income was below \$5,000 compared with 117.5 and 115.2 per 1,000 children in the two higher income level groups. The income level pattern in these rates was consistent for boys and girls

but in only three of the age groups—6, 7, and 10 years—in the 6-11 year span.

Across all three family income levels, the prevalence of eye abnormalities was greater among children age 6-11 years from the previous national survey than youths age 12-17 years in the present national survey (figure 12). This age differential exists across income among both boys and girls and with one minor exception, at age 6 years, the age specific rates for children are higher than those for youths.

The prevalence rates for any eye abnormality are also maximal among both children and youths of the white races from the lowest income level families (table 20). In contrast, Negro children and youths in the highest income level families show the highest rates for these conditions but the number of Negroes in the population is too small to provide reliable estimates in this detail with the size of the samples used in this national survey (table 21).

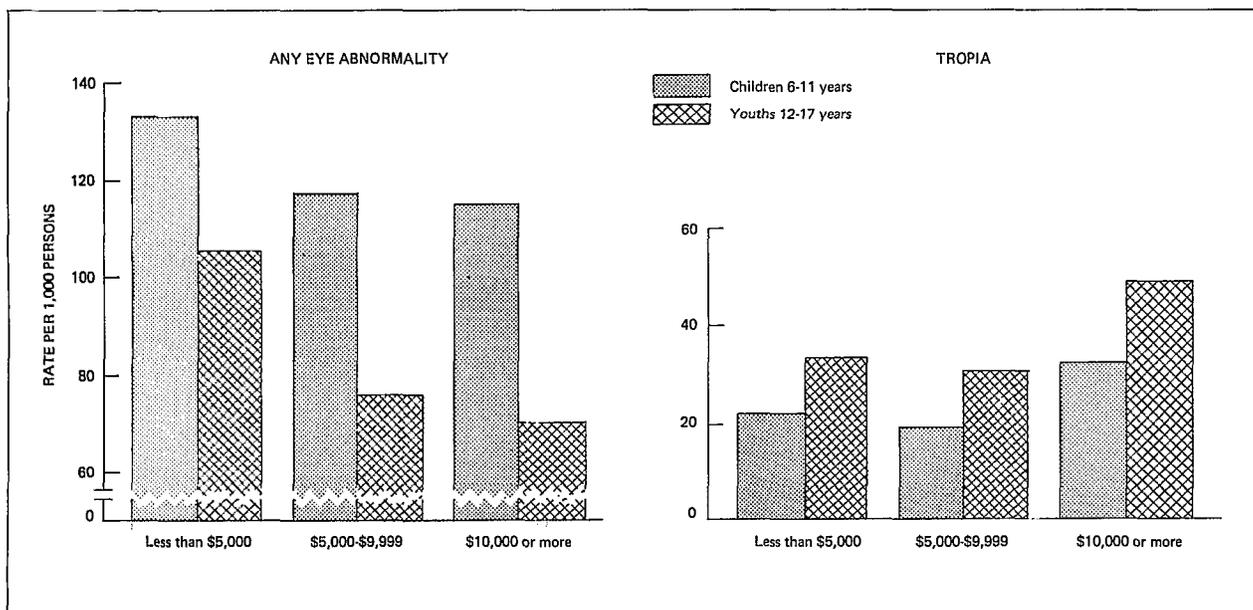


Figure 12. Prevalence rates for any abnormal findings and for tropia from eye examinations of children 6-11 years and youths 12-17 years by annual family income: United States, 1963-70.

In contrast to the findings for any eye abnormality, the most prevalent of these conditions among youths—tropia—occurs relatively more frequently among both children and youths in the highest income level families. Among youths, the prevalence rate for tropia is 49.3 per 1,000 youths in families with \$10,000 or more annual income compared with 33.2 and 30.8 per 1,000 youths in families with less than \$5,000 and \$5,000-\$9,999 annual income (table 17). However, this pattern is present among girls but not boys and is not consistent across the 12-17 year age range. For children in the highest income level group the rate was 32.3 per 1,000 compared with rates of 22.4 and 19.9 in the lowest and middle income bracket. This pattern existed among both boys and girls age 6-11 years.

Similar to the findings by region and race, the prevalence of this condition—tropia—was lower among children than youths across all three family income levels for both boys and girls.

As for all racial groups combined, the prevalence of tropia was greatest among white children and youths from the highest income level families (\$10,000 and over). For the Negro population the findings here are inconsistent because

the sample was too small to provide reliable estimates in this detail.

Medical Histories

Wearing glasses.—More than one-third (35.3 percent) or 8 million youths age 12-17 years in the noninstitutionalized population of the United States wear glasses or contact lenses, as estimated from the Health Examination Survey of 1966-70. About 4 percent of this group wear contact lenses, with the remaining 96 percent wearing only glasses. These estimates are based on the answer given by the youth examinee in the self-administered *Health Habits and History* questionnaire. Responses from the *Medical History-Youth* as given by the parent for him or her show a negligibly lower proportion of youths wearing glasses or contact lenses—34.2 percent compared with 35.3 percent from the youth's own response (table 22).

Relatively more girls than boys age 12-17 years wear glasses or contact lenses (29.4 percent for boys compared with 41.2 percent for girls as reported by the youths; 28.5 percent for boys compared with 40.0 percent for girls as reported for them by their parents).

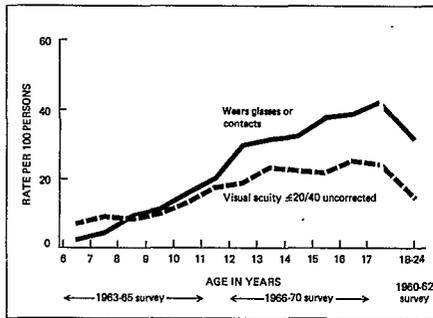


Figure 13. Proportion of children, youths, and young adults 6-24 years wearing glasses or contact lenses and proportion with defective distance acuity of 20/40 or less by age: United States, 1963-65, 1966-70, and 1960-62.

In this age group the proportion of youths indicating they wear corrective lenses increases with age from 29.7 at 12 years to 42.8 percent at 17 years. The proportion of this group who wear contact lenses shows an even more rapid rise with age from 1 percent of those wearing corrective lenses at age 12 years to 8 percent at age 17 years.

Comparable data on the wearing of corrective lenses are available from the two previous national Health Examination Surveys among non-institutionalized children 6-11 years in 1963-65 and adults in 1960-62. The proportion wearing corrective lenses increased consistently from 2.3 percent at age 6 years to 43.0 percent at age 17 years then drops to 31 percent for the 18-24 year-old (figure 13). As a rough indicator of the need for corrective lenses the figure also shows the proportion of children, youths, and young adults whose uncorrected binocular visual acuity was no better than 20/40. The proportion with this degree of binocular visual deficiency generally increased with age from 7.4 percent at 6 years to 24.2 percent at 17 years then dropped to 14.8 percent at 18-24 years. In the surveys among children and youths, the methods for testing visual acuity were similar. Test results were somewhat less reliable at ages 6 and 7 years because of the number at those ages who were unable to read letters.¹⁰ Testing methods in the national survey among adults were also not completely comparable to those used for children and youths and the test targets for adults provided a somewhat less precise estimate of visual acuity as previously described.^{6,11} The propor-

tion wearing glasses or contact lenses consistently exceeds the proportion whose uncorrected acuity is no better than 20/40 at distance except for the youngest children ages 6 and 7 years. Among the latter group less than half of the children (6 or 7 years) with that degree of defective acuity were reported to be wearing glasses. This may reflect in part the less accurate visual acuity test results for them, as well as some unmet need for vision care. The fact that the proportion wearing corrective lenses increases more rapidly with age than the proportion with that degree of defective binocular acuity reflects, of course, the need for corrective lenses for near vision as well as other types of visual problems than just defective distance acuity.

The proportion wearing corrective lenses increases with age more rapidly and consistently among girls than boys from about 3 percent for both at age 6 years to 51 percent for girls and 35 percent for boys at age 17 years (figure 14) as expected since the prevalence of defective acuity increases more rapidly with age among girls than boys over this age range.^{6,10} Comparable data for 1960-62 on wearing of corrective lenses among young adult men and women (figure 14) shows a proportion using them among both groups substantially below that at age 17 years in the present study for 1966-70.

Youths in the present survey were asked about the extent and type of use made of these corrective lenses—glasses or contact lenses. For the entire 12-17 year age range, youths were slightly more likely to wear corrective lenses all day (18.3 per 100 youths) than just for special occasions (17.1 per 100 youths). Boys were

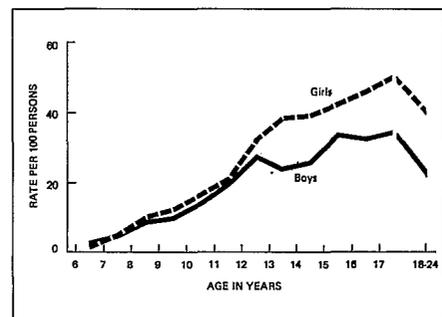


Figure 14. Proportion of males and females wearing glasses or contact lenses among children, youths, and young adults 6-24 years by age: United States, 1963-65, 1966-70, and 1960-62.

slightly more likely to wear them full time than not (16.6 percent full time, 13.0 percent part time) while girls were slightly more likely to wear them part time than full time (21.4 percent compared with 20.1 percent). Across the 12-17 year age range for boys and girls, only at ages 15 and 17 years for girls did the rates for special or part time use exceed those for full time (table 23).

Youths were more likely to wear corrective lenses for reading (7.1 percent of all youths) than for distance vision (4.9 percent of all youths) when they did wear them only part of the time. The proportion of all youths wearing them just for distance vision increased with age from 2.7 percent at age 12 years to 7.9 percent at 17 years, while the proportion wearing glasses (or contact lenses) just for reading showed no consistent trend with age.

Need for glasses.—An estimated 11.6 percent or 2.6 million youths age 12-17 years reported they do not wear but need glasses. The proportion is nearly twice as great among girls as boys—15.0 percent compared with 8.8 percent (table 22). Older girls 15-17 years were slightly more likely than younger girls age 12-14 years to need glasses—the rates are 16-19 percent among older girls compared with 12-14 percent among the younger group under age 15 years—but the proportions for girls consistently exceed those for boys across the age range.

The estimate of need for glasses as reported by the youths is nearly twice as great as that known to the youth's parents. From the medical history given for these youths by the parents, only 6.4 percent stated that the youths needed glasses while an additional 15 percent indicated they did not know. Thus, for about half of this latter group the parent was not aware that the youth thought he or she needed glasses.

Youths who wore glasses or contact lenses were asked whether with them they thought they saw as well as most. Among the 35.3 percent of youths who do wear such corrective lenses 93.3 percent indicated that they thought they did see as well as most. The proportion was just slightly higher among girls (93.9 percent) than boys (92.5 percent) and showed no consistent trend with age.

When youths who wore glasses or contact

lenses were asked if they needed a change about one in five or 21.0 percent (of those who wore them) indicated they did need a change. The proportion ranged from 20.2 percent at age 12 years to 22.4 percent at age 16 years but showed no consistent age-related trend. The rate was slightly greater among girls (21.4 percent) than boys (20.5 percent). Among this group stating they needed a change about two-thirds or 14.3 percent had also said they thought they saw as well as most with their present glasses or contacts. The proportion of this latter group—needing a change but seeing as well as most—was over twice as large among girls as boys (19.8 percent of girls compared with 8.9 percent of boys among those wearing corrective lenses).

Other eye conditions.—More than 6 percent of youths age 12-17 years, or an estimated 1.5 million, had ever had eye trouble other than what is corrected by glasses or contact lenses. The proportion based on the parent's report for the youths on the *Medical History - Youth* (6.8 percent) is just slightly greater than that based on the youth's answer for himself in the *Health Habits and History* (6.4 percent). The agreement for girls in answers from the two histories (7.0 percent as reported by the parent, 7.1 percent as reported by the girls) is slightly closer than that for boys (6.7 percent from the parents, 5.6 percent from the boys themselves).

Eye operations.—The proportion of youths who had had an eye operation for strabismus, because of an injury, or for some other reason was 1.4 percent, based on the *Medical History - Youth* as given by the parent. Except for the youngest and oldest—ages 12 and 17 years—where the rates among both sexes were nearly identical, the proportion among boys was nearly three times as large as that among girls (at ages 13-16 years).

Facilities for the visually handicapped.—Some further indication of the functional severity of visual defects was obtained in the reports from the school, where the teacher with the most immediate knowledge of the youth (for those still in school) indicated whether the youth needed special educational facilities because of a severe visual handicap. The proportion ranged from a minimum of 0.1 percent at ages 13 and 16 years to a maximum of 0.4 percent at age 15 years and was generally similar among boys and girls

(0.2 percent). Most of the youths needing these additional facilities appeared to be receiving them though the proportions with this degree of handicap are so low that reliable estimates for them could not be obtained with the sample size used in this survey.

Relation of histories.—While estimates of the proportion of youths wearing glasses or contact lenses based on the medical history given for the youth by his or her parent and that given directly by the youth are in close agreement, the estimates of the need for glasses from these two sources differ substantially, as previously indicated, and will be considered further here.

The extent and type of disagreement with respect to the need for glasses between these two sources are shown in table 24. Among the youths who do not wear glasses or contact lenses both on the statement by the parent and the youth, there is nearly 80 percent agreement between the two answers with respect to this need. The agreement is just slightly better in the responses for boys than girls (81 percent compared with 77 percent). Where the parent and youth disagree regarding the need for glasses the youth is more likely to feel the need for glasses when the parent does not than the reverse (4.2 percent with parent saying no but youth yes, compared with 1.6 percent with parent saying yes and youth no).

In addition 7 percent of the parents indicated the youth had glasses but the youth stated he did not. These may be youths who have lost or misplaced their glasses but that fact was not known to the parent. An additional 18 percent of the youths stated they had glasses but the parent either had forgotten or appeared to be unaware of that fact.

Relation to visual acuity.—Comparisons have been made in the preceding sections between the proportion of youths with defective distance acuity and the proportion wearing and/or needing glasses (the 35.3 percent as reported by the youths, 34.2 on parent reports for them). The actual relationship between the acuity test results and responses from parent and youth regarding the wearing of or need for glasses gives some indication of the reliability or meaning of the responses from the two history sources. This consideration will be limited to those youths with at least "normal" binocular acuity (20/20 or

better at distance, 14/14 or better at near) and those with moderate or more severely defective binocular acuity (20/40 or less at distance, 14/28 or less at near), recognizing that glasses or contact lenses are needed for visual defects other than those apparent from binocular acuity tests as given in this examination.

Among youths whose uncorrected binocular distance acuity is 20/20 or better, 15.7 percent stated they owned glasses or contact lenses compared with 14.6 percent based on parent histories for these youths (table 25). For those with at least normal uncorrected binocular near acuity (14/14 or better), the rates are 27.2 percent based on the youths' response and 26.4 percent from the parent statement for them. The proportion of these youths with at least "normal" vision uncorrected who are wearing corrective lenses increases with age, more consistently on the basis of the parent's answer, but on either history basis is significantly greater among youths 15-17 years than those under 15 years. The proportions are nearly twice as great among girls as boys, and there is a similar small underreporting by the parent for both groups. It should be kept in mind that youths who test at least normal on distance acuity may need glasses for near work (hyperopic) and that those who have at least normal near acuity may need glasses for distance vision (myopic) in addition to those with relatively normal binocular vision but problems of astigmatism or motility.

Nearly 90 percent of youths with moderate to severely defective binocular acuity at distance and near are wearing glasses or contact lenses, on the basis of the history given by the youth or by his parent. The agreement is slightly better between parent and youth answers among this group than for those with essentially normal acuity. The proportion who have corrective lenses are similar among boys and girls (88-90 percent) on the basis of either history and increase with age from about 80 percent at 12 years (85 percent on youth responses for defective near acuity) to 96 percent or more at age 17 years.

Prevalence estimates of the need for glasses among youths age 12-17 years are consistently nearly twice as great on the basis of the reports by the youths as by their parents for them, both among youths with at least "normal" and those with defective binocular acuity at distance and

near (table 26). This degree of differential in reported need is present among both boys and girls with "normal" and "defective" acuity. Across age the rates from the youth responses are consistently higher, with the insignificant exception at age 16 years. The proportion needing glasses is 6 (distance) and 7 (near) times as great among those with moderately to severely defective binocular distance and near acuity than those with at least "normal" acuity from the youth responses and about 7 (distance) to 9 (near) times as great based on the parent history data.

Medical Histories - Race, Region, Income

Racial, geographic regional, and family income differentials with respect to the wearing of and need for corrective lenses and the medical history of other eye conditions as reported independently by the youth and by his parent are analyzed here. Comparison is made, where possible, to the findings among U.S. children from the previous Health Examination Survey of 1963-65.

Race.—The proportion of youths wearing glasses or contact lenses is half again as large among white as Negro youths. From the youth's history the rates are 36.7 per 100 white youths

compared with 24.9 per 100 Negro youths. From the parent's reports for these youths the proportions are similar but just slightly lower among both races—35.7 per 100 white youths and 23.5 per 100 Negro youths (table 27). Among youths who wear glasses, white youths are also more likely than Negro youths to wear them all day rather than for special uses.

Racial differentials in the wearing of glasses could be expected since the previous report on visual acuity of youths shows the prevalence of defective acuity to be substantially greater among white than Negro youths.⁶ For example, the proportion with distance acuity of 20/40 or less (only one of the visual defects for which refraction may be needed) is 65 percent greater among white than Negro youths age 12-17 years (23.6 per 100 white youths, 14.3 per 100 Negro youths). (Figure 15.)

The proportion wearing glasses is substantially greater among both white boys and girls age 12-17 years than their Negro counterparts, and for each racial group is significantly greater among girls than boys, again reflecting the greater need for refraction among girls than boys of either race and among white than Negro youths. Youth reports show 30.8 per 100 white boys wearing corrective lenses compared with

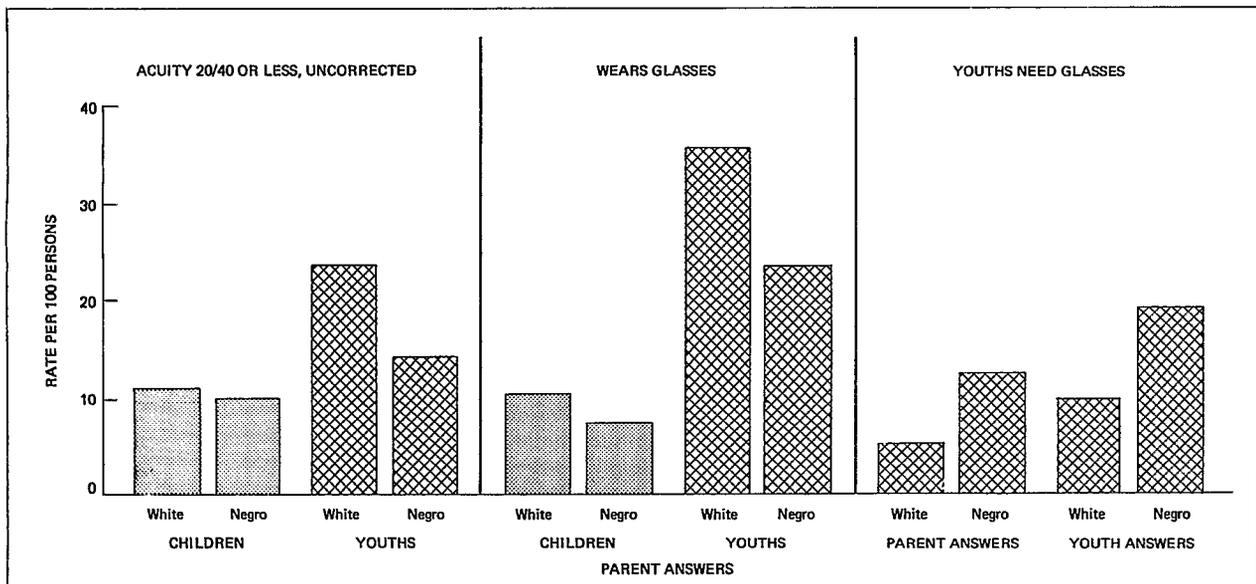


Figure 15. Proportion of white and Negro children 6-11 years and youths 12-17 years with defective distance acuity, wearing glasses or contact lenses, and needing glasses: United States, 1963-70.

19.3 per 100 Negro boys; and 42.8 per 100 white girls compared with 30.4 per 100 Negro girls. The corresponding rates from parent histories for these youths are just slightly lower than those from the youths themselves in each of the four groups.

There is a consistent increase with age in the proportion wearing glasses among white youths from 30.1 per 100 white 12-year-olds to 43.7 per 100 white 17-year-olds, based on the youth's own history (and from 28.4 at age 12 to 42.0 at age 17 years based on the parent's report). Among Negro youths, the proportion wearing glasses at each year of age remains consistently less than among white youths and does reach a maximum for them at age 17 years but shows no consistent increase with age, probably reflecting in part the lesser precision possible for the estimates among this smaller group in the population from the size sample used in the survey.

The pattern of racial differences in the wearing of glasses among U.S. youths is similar to but more pronounced than that among U.S. children from the previous Health Examination Survey in 1963-65. At ages 6-11 years, parent reports showed 10.8 per 100 white children compared with 7.4 per 100 Negro children wearing glasses or contact lenses. At that age also the proportions with defective acuity were only slightly higher among the white than Negro children.

Among youths, while proportionately more white than Negro youths are wearing corrective lenses and have defective acuity, the proportion of Negro youths not wearing but needing glasses is significantly greater than among their white counterparts. The rates based on history given by the youths are 19.3 per 100 Negro youths compared with 10.1 per 100 white youths. On the basis of the parent history for them, the rate among the Negro youths is over twice that among the white group—12.7 per 100 compared with 5.2 per 100. This relatively greater need among the Negro than white groups exists among both boys and girls and across the 12-17 year age range.

In response to seeing as well as most with their present glasses, the rates are slightly greater among white than Negro youths (93.7 percent of white youths, 90.2 percent of Negro youths). However, when asked about a need for change in their present glasses the rates are

substantially greater among Negro youths—40.1 per 100 Negro youths wearing glasses compared with 19.2 per 100 white youths wearing glasses.

Other eye trouble, than that which could be corrected with glasses, was reported more frequently among Negro than white youths. However, answers regarding this in the parent and youth histories for white youths were in fairly close agreement (6 per 100 from either source) while those for Negro youths show a lower prevalence rate in their own report (8.5 percent) than in the report from their own parents (11.8 percent).

Relatively more white than Negro youths were reported to have ever had an eye operation—1.5 per 100 white youths compared with 1.0 per 100 Negro youths, and among both racial groups the proportion is greater among boys than girls. However, the differences in these rates are not large enough to be considered statistically significant with the size and design of the sample used in this survey.

Geographic region.—Youths in the South, where the prevalence of defective acuity among this age group 12-17 years is the lowest,⁶ are less likely to wear glasses or contact lenses than those in the other regions of the country (table 28). The proportion wearing corrective lenses ranges from 25.2 per 100 youths in the South to 41.1 per 100 youths in the Midwest on the basis of the youth's statements (24.5 per 100 youths in the South compared with 40.7 per 100 youths in the Midwest from the parent's medical history for them). This regional pattern is found among both boys and girls.

If only the white youth population in each of the regions is considered, the proportion of white youths wearing corrective lenses is lowest in the South and highest in the Midwest for both boys and girls. Among Negro youths, while the proportion wearing glasses is also lowest in the South among both boys and girls, the rates are slightly higher among those in the Northeast than elsewhere (table 29 and 30).

Recognized need for glasses is slightly greater in the South among both boys and girls than elsewhere in the country. On the basis of the youths reports, 15.6 percent in the South need glasses compared with 11.3 percent in the Midwest, 10.5 percent in the West and 7.9 percent in the Northeast. The rates based on parents'

responses are again slightly lower—9.5 percent of youths in the South, and 5.0-5.4 in the other three regions.

White youths show a similar regional pattern in their need for glasses—the rates are highest in the South (12.9 percent based on the youth's report and 7.3 percent based on the history given by the parents). From the youths' response the rates are slightly lower in the Northeast than elsewhere, while from the parent history they are slightly lower in the Midwest and Northeast than in the West. The proportion of Negro youths needing glasses is slightly greater in the South than elsewhere among boys but not girls, while on the basis of the parent report the rates are highest in the South for both Negro boys and girls.

The proportion of those with glasses needing a change is slightly greater among those in the South and West than elsewhere—a pattern found among both white and Negro youths. In each of the four regions, the proportion of youths needing a change in their present glasses is substantially greater among the Negro than white youths.

The prevalence of other eye trouble, not

correctable with glasses among youths, is generally similar in the four regions—ranging from 5.4 percent in the Northeast to 7.2 percent in the South when reported by the youths and from 5.7 percent in the Midwest to 7.7 percent in the South when reported for them by their parents.

History of eye operations was reported slightly less frequently among youths in the Midwest (1.0 percent) and more frequently among those in the West (1.7 percent) than elsewhere.

The need for special educational facilities in the school for the visually handicapped was slightly more frequently reported by the teacher among youths in the Northeast (0.5 percent) than elsewhere, though the proportions needing this type of facility were too small to give reliable estimates of regional need.

Comparison with findings among U.S. children from the previous Health Examination Survey in 1963-65 show a somewhat similar regional pattern to that for U.S. youths in the present study, with the lowest proportion of defective acuity and of wearing glasses and the highest proportion not wearing but in need of glasses among children in the South than elsewhere (figure 16).

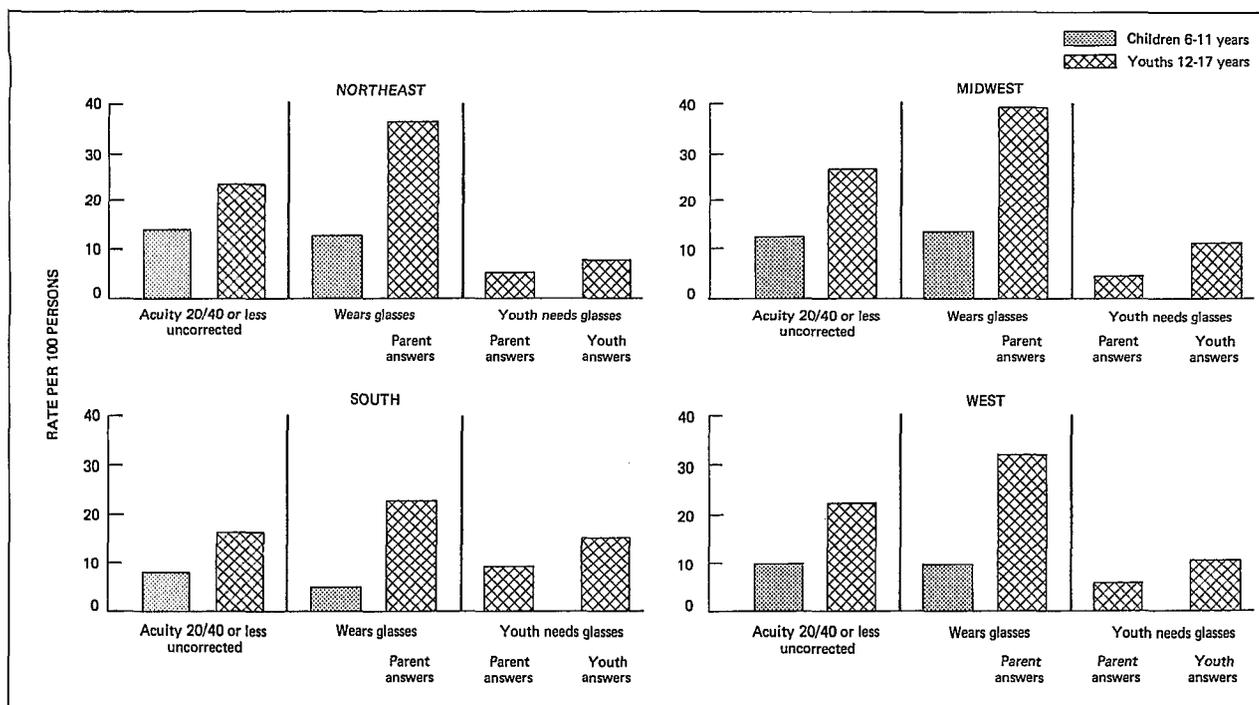


Figure 16. Proportion of children 6-11 years and youths 12-17 years with defective distance acuity, wearing glasses or contact lenses, and needing glasses by geographic region: United States, 1963-70.

Income.—Youths age 12-17 years from higher income level families are substantially more likely than those from poorer families to wear glasses or contact lenses, either all day or part of the time. Some, but not this extent of association with income, would be expected since the proportion with defective acuity among these U.S. youths has been shown to increase with income.⁶ From the youth's report, the proportion wearing corrective lenses increased from 28.7 percent among those in families with annual income under \$5,000 to 40.3 percent among those in families with \$10,000 or more annual income (table 31). The corresponding rates based on parent histories for these youths are just slightly lower but show a similar trend, increasing from 27.5 percent to 39.7 percent. This economic relationship exists both with respect to the wearing of glasses and contact lenses.

The increase with income in the proportion wearing corrective lenses is found among both white and Negro youths, but is more rapid for the latter. Among Negro youths 22.2 per 100 with family income less than \$5,000 report they are wearing glasses or contact lenses compared with the rate of 36.6 per 100 among those with family incomes of \$10,000 or more; while among white youths the increase is from 31.4 per 100 to 40.2 per 100 (tables 32 and 33).

The proportion of youths who wear glasses or contact lenses within each income level is greater among white than Negro youths, however, the racial difference in the rates decreases with income from about 9 percent among those in families with annual income under \$10,000 to less than 4 percent among those in the level of \$10,000 or more.

The increase with family income in the proportion of youths wearing corrective lenses is more rapid than that found among U.S. children age 6-11 years from the preceding Health Examination Survey in 1963-65 (figure 17). On the basis of parent histories for both age groups, the rate among youths increased from 27.5 per 100 in the lowest income level (under \$5,000) to 39.7 per 100 in families with income of \$10,000 or more. The increase among children was from 7.7 per 100 with annual family income below \$5,000 to 12.4 per 100 in the highest level (\$10,000 or more). A corresponding increase with income in the proportion with defective acuity is present among both children and youths as indicated in figure 17 with respect to defective distance vision.

Among youths both the need for glasses and the need for a change, if they are now worn, is substantially greater among those in the lowest income level families, with under \$5,000, than among youths from middle or higher income

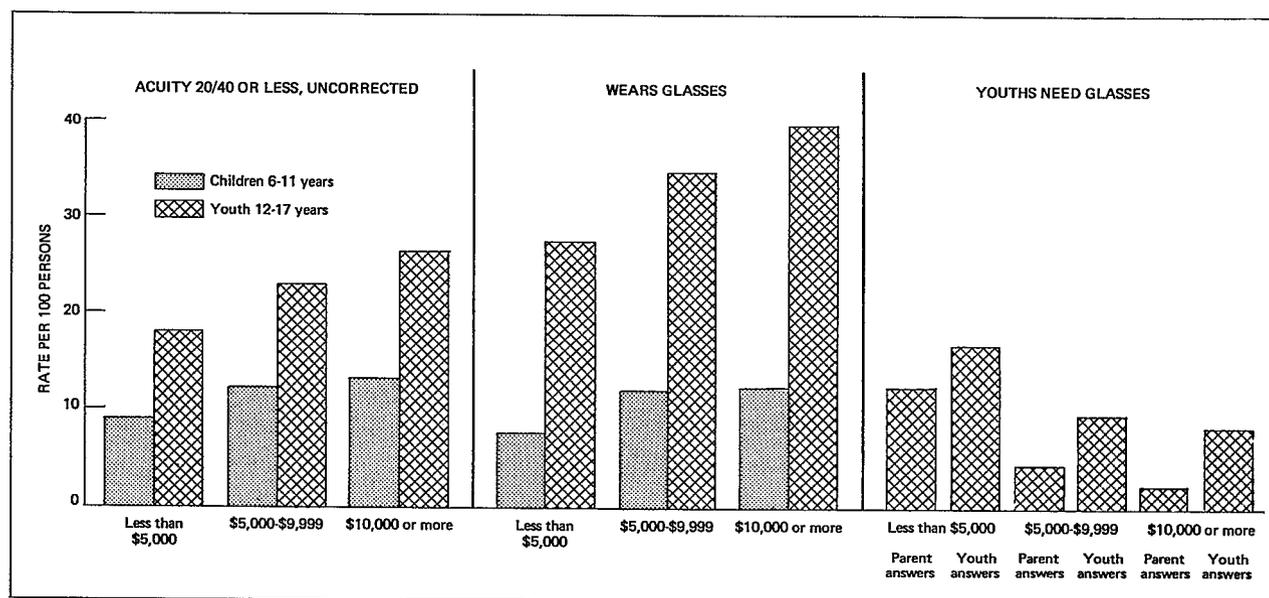


Figure 17. Proportion of children 6-11 years and youths 12-17 years with defective distance acuity, wearing glasses or contact lenses, and needing glasses by annual family income: United States, 1963-70.

level families. Based on the youths' responses, the proportion needing glasses decreases from 16.8 percent for those with under \$5,000 family income to 8.5 percent at the \$10,000 or more level; while the proportion needing a change in their present glasses decreases from 30.2 percent to 15.6 percent. The underreporting of the youths' need for glasses by the youths' parents is found across income and is greater at the highest income level than for those with less than \$10,000 incomes. The association between family income and the need for glasses or for a change among white youths is similar. This decreased need for glasses or new glasses with increase in family income is evident among white youths but only for need as reported by the parent for Negro youths.

History of eye trouble (as reported by the parents), other than that correctable with glasses, is slightly more prevalent among those youths in the lowest income level families than others. This trend is present among both white and Negro youths.

No significant or consistent association with income was found with respect to having had an eye operation.

Children - Youth Comparison

The sample design and methods used in the 1966-70 Health Examination Survey among youths age 12-17 years make it possible to obtain some limited longitudinal health data on eye conditions and related medical history for nearly one-third of these youths in addition to the findings from this present cross-sectional study described and analyzed in the preceding sections. In this 1966-70 Health Examination Survey among a national probability sample representative of noninstitutionalized youths age 12-17 years, the same sampling areas and housing units were utilized as in the preceding 1963-65 Health Examination Survey among a national probability sample representative of noninstitutionalized children age 6-11 years. As a result, about 31 percent of the youths in the present study had also been examined in the children's survey. The time lapse between the two examinations ranged from 28 months to 5 years, with a median time lapse of 4 years. Since the group reexamined is limited to those

living in the same location at both points in time and who were willing to be examined again, this subgroup cannot be considered typical of the total group of youths.

Parts of the eye examination were similar in both surveys. In addition, medical history questions pertaining to the wearing of glasses or contact lenses, other eye problems not correctable with glasses, and previous eye operations were asked of the parent and the need for special facilities for visually handicapped were obtained from the school in both the children's and youth's surveys. These data, where comparable, permit the analysis of change in eye conditions for these youths from the time of the first examination to the time of the second or over the 2-5 year period.

As may be seen in table 34, about half of the youths ages 12-14 years had been in the previous children's survey, by age 15 years only one-fourth had had both examinations, and at age 16 years the proportion was less than 2 percent.

From the eye examination, the prevalence estimates of tropia or manifest strabismus were slightly higher among this subsample at the time of the second examination than they were in the first examination (3.7 per 100 at the time they were age 12-16 years compared with 2.8 per 100 at the time they were age 6-11 years). Nearly one-third of the youths with this condition had also had this problem at the time of the first examination (1.1 per 100), for the remaining two-thirds this condition had not been present or detected at the time of the first examination (2.6 per 100); while slightly more than half of the children with this finding in the first examination did not have it at the time of the second (1.7 per 100).

The prevalence of other extraocular muscle conditions among youths in this subgroup is less than half that as determined at the time of their first examination, similar to the findings for all youths and all children from each of the two surveys. Since as previously noted rigorous criteria were used by the examiners for this group of conditions in this part of the examination among youths than had been used in the children's study and possibly the cooperation of the youth examinees with the examiner may have been better than it had been among children, the decrease in

prevalence rates is probably an artifact of method rather than any real decrease in prevalence.

Prevalence rates for the three infectious or allergic conditions of the lids and adjacent tissue—blepharitis, conjunctivitis, and styes—among the youths who had also been examined as children were similar to those for all youths and, at the earlier point in time for them, similar to the rates among all children. The prevalence of blepharitis and styes was slightly greater for them when they were in the age range 6-11 years and that for conjunctivitis slightly less than at the time of their second examination. (Blepharitis 3.7 per 1,000 youths, 5.3 per 1,000 as children; conjunctivitis 7.3 per 1,000 youths, 4.4 per 1,000 as children; and styes 2.2 per 1,000 youths, 3.0 per 1,000 as children, for those examined in both surveys.)

Three questions in the medical history obtained from the parent in both surveys are probably comparable—the wearing of glasses or contact lenses, previous eye operations, and previous eye trouble not correctable with glasses (table 35). Among this subgroup, the proportion of youths reported by their parent to have glasses or contact lenses at the time of the second examination was slightly lower than for all youths (31.6 per 100 compared with 34.2 per 100 for all youths). The proportion based on their own answer to this question was also lower than that for all youths (32.5 per 100 compared with 35.3 per 100 for all youths). However, the proportion in this subgroup who had worn them as children (15.9 per 100) was substantially greater than it had been for all children (10.3 per 100) at the time of the first examination. More than one-third of the youths with corrective lenses in this subgroup had also had them as children (13.7 per 100), while only about one in eight who wore them as children no longer wore corrective lenses (2.2 per 100).

The proportion with previous eye operations reported in the history by the parent for this subgroup were similar to these data for all youths and all children and were slightly greater by the time of the second examination (1.4 per 100 as youths compared with 1.2 per 100 as children for this subgroup). The majority of the eye operations had been performed before the age of 12 years and there was negligible evidence of under-

reporting at the time of the second examination (0.2 per 100 whose parents had reported such an event for them at the time of the first but not the second study).

Other eye trouble not correctable with glasses was less prevalent among youths as it had been among children both for the subgroup at two points in time and for the total groups of youths and children. The parent answers to this history question probably reflect some differences in the content of the histories in the two examinations as well as a memory problem with these conditions that were probably less serious than those requiring surgery.

SUMMARY

This report contains national estimates of the prevalence of eye conditions and related problems of noninstitutionalized youths age 12-17 years in the United States based on eye examination, vision test, and medical history findings of youths examined in the Health Examination Survey of 1966-70. Findings are shown for the total youth population as well as by race, geographic region, and family income. Also included are data on the extent of change in eye problems and related history over a 2-5 year period for the nearly one-third of the youths who had also been examined in the Health Examination Survey of 1963-65 among U.S. children age 6-11 years.

For this survey, a probability sample of 7,514 youths was selected to represent the 22.7 million noninstitutionalized youths age 12-17 years in this country at midsurvey point. Of these, 6,768 (90 percent) were examined. The examined group closely represented the target population from which the sample was drawn with respect to age, sex, race, geographic region, population size of place of residence, and rate of change in size of place of residence from 1950-1960.

The principal findings include:

Nearly one-twelfth or an estimated 1.8 million youths in the United States have one or more significant eye abnormalities as determined by direct examination, the most prevalent of which is tropia or manifest strabismus.

Boys were substantially more likely than girls at age 12-17 years to have significant eye conditions but no marked trend with age was evident.

These types of eye conditions were substantially less prevalent among U.S. youths age 12-17 years from the present study (79.2 per 1,000 youths) than among U.S. children age 6-11 years from the previous Health Examination Survey (91.8 per 1,000 children).

The rate for tropia or manifest strabismus which was the most prevalent of these eye conditions among youths was 34.5 per 1,000 youths and was slightly greater than the rate of 23.8 per 1,000 children from the previous survey findings.

The prevalence of eye abnormalities was greater among youths in families with less than \$5,000 per year annual income than those with \$5,000 or more but showed no significant differential by race or geographic region.

Nearly one-eighth or 2.6 million youths age 12-17 years in this country indicate they do not wear but need glasses. The proportion is nearly twice as great among girls as boys and is greater among older than younger youths, consistent with the increase in defective visual acuity during this age range. Parents were aware of the need for only about half of those youths.

In addition nearly one-fifth of those youths who owned glasses or contact lenses indicated they needed a change in them.



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Table 1. Prevalence rates of eye abnormalities observed on direct examination of youths 12-17 years, by area of eye affected, age, and sex: United States, 1966-70

Age and sex	Abnormal findings-one or both eyes							
	Any eye abnormality	Lids, conjunctivae, sclerae	Pupils, irides	Tropia	Other extra-ocular muscle conditions		Other eye conditions	
					Any type	Latent strabismus		
<u>Both sexes</u>		Rate per 1,000 youths						
12-17 years-----	79.2	21.4	9.6	34.5	18.3	4.7	4.8	
12 years-----	81.8	25.7	10.4	31.4	15.4	4.1	6.5	
13 years-----	77.2	20.3	9.0	34.9	18.3	4.7	4.1	
14 years-----	75.5	20.9	9.6	35.6	16.5	4.2	5.0	
15 years-----	64.8	14.0	7.9	28.1	16.5	2.5	5.8	
16 years-----	86.8	24.0	7.2	32.9	27.5	6.7	3.4	
17 years-----	90.0	23.4	13.7	44.7	16.0	5.8	3.6	
<u>Boys</u>								
12-17 years-----	89.3	26.8	11.2	38.8	18.9	6.0	6.3	
12 years-----	86.6	27.8	13.3	28.8	16.5	4.3	8.7	
13 years-----	81.6	20.4	13.3	37.0	16.7	7.9	4.3	
14 years-----	90.2	30.3	11.1	38.0	20.5	8.4	6.1	
15 years-----	81.0	22.9	8.7	31.6	17.5	1.4	11.5	
16 years-----	95.4	28.9	7.5	43.9	22.6	6.0	1.9	
17 years-----	102.9	31.2	12.9	55.6	17.9	8.3	4.9	
<u>Girls</u>								
12-17 years-----	68.8	15.8	8.0	30.1	17.5	3.2	3.2	
12 years-----	76.9	23.5	7.5	34.0	12.1	3.9	4.2	
13 years-----	72.6	20.2	4.5	32.8	17.1	1.4	3.9	
14 years-----	60.5	11.3	8.0	33.2	12.4	-	3.8	
15 years-----	48.2	4.9	7.2	24.5	15.4	3.6	-	
16 years-----	77.9	18.9	6.9	21.7	32.7	7.5	4.9	
17 years-----	76.9	15.5	14.5	33.6	14.1	3.4	2.3	
<u>Both sexes</u>		Standard errors of rates						
12-17 years-----	5.4	2.6	2.3	4.5	2.2	1.6	0.8	
12 years-----	9.6	4.9	4.9	8.0	2.9	2.0	2.9	
13 years-----	7.1	4.9	3.4	6.2	4.4	2.4	2.0	
14 years-----	8.6	3.6	3.1	5.5	2.8	2.5	1.6	
15 years-----	8.3	3.7	2.3	5.9	4.4	2.5	1.8	
16 years-----	9.6	3.1	2.7	6.7	3.6	2.2	1.4	
17 years-----	12.7	5.9	5.1	8.0	4.0	2.7	1.8	
Boys, 12-17 years-----	7.3	4.3	3.3	5.8	3.0	1.9	1.5	
Girls, 12-17 years-----	6.6	2.2	1.9	4.9	2.4	1.6	0.8	
<u>Both sexes</u>		Number of youths in thousands						
12-17 years-----	1,798	486	219	782	417	107	109	
12 years-----	328	103	42	126	62	17	26	
13 years-----	305	80	36	138	73	19	16	
14 years-----	291	81	37	137	64	16	19	
15 years-----	243	53	30	105	62	10	22	
16 years-----	315	87	26	119	100	25	12	
17 years-----	316	82	48	156	56	21	13	
Boys, 12-17 years-----	1,027	309	129	445	220	70	73	
Girls, 12-17 years-----	771	177	90	336	197	37	36	

Table 2. Prevalence rates for selected conditions of the eye lids observed on direct examination of youths age 12-17 years, by type of condition, age, and sex: United States, 1966-70

Age and sex	Total with abnormal lids	Blepharitis	Conjunctivitis	Stye	Seborrhea	Laceration	Hemorrhage	Scar	Nevus	Ptosis	Other
<u>Both sexes</u>		Rate per 1,000 youths									
12-17 years----	21.4	3.4	6.2	1.3	1.3	0.3	1.1	0.5	2.0	1.9	3.4
12 years-----	25.7	4.4	5.9	2.7	2.8	-	1.4	-	2.3	1.2	5.1
13 years-----	20.3	3.2	5.4	1.0	1.1	1.2	1.3	0.7	0.9	1.6	4.0
14 years-----	20.9	3.1	6.7	1.4	1.7	0.6	0.8	0.6	2.0	2.0	2.1
15 years-----	14.0	2.1	5.4	-	-	-	-	0.8	0.6	2.9	2.2
16 years-----	24.0	4.0	6.7	1.3	1.2	-	1.9	-	3.5	1.0	4.4
17 years-----	23.4	3.3	7.2	1.1	0.6	-	1.2	1.2	3.1	3.0	2.8
<u>Boys</u>											
12-17 years----	26.8	4.6	9.2	1.5	1.1	0.4	1.2	0.5	2.0	2.4	3.9
12 years-----	27.8	5.3	8.0	5.4	2.0	-	1.0	-	-	2.4	3.8
13 years-----	20.4	1.6	5.9	-	-	2.3	2.5	1.3	1.8	-	5.0
14 years-----	30.3	6.1	10.2	1.3	3.3	-	1.6	-	3.9	1.5	2.5
15 years-----	22.9	4.1	8.7	-	-	-	-	1.7	-	5.7	2.9
16 years-----	28.9	6.0	10.5	-	-	-	2.2	-	2.7	1.9	5.7
17 years-----	31.2	4.7	12.5	2.2	1.3	-	-	-	3.7	3.2	3.6
<u>Girls</u>											
12-17 years----	15.8	2.1	3.1	1.0	1.4	0.2	1.0	0.6	2.1	1.4	3.0
12 years-----	23.5	3.4	3.7	-	3.7	-	1.8	-	4.6	-	6.3
13 years-----	20.2	4.9	5.0	1.9	2.3	-	-	-	-	3.1	3.0
14 years-----	11.3	-	3.2	1.5	-	1.2	-	1.2	-	2.5	1.6
15 years-----	4.9	-	2.0	-	-	-	-	-	1.3	-	1.6
16 years-----	18.9	1.9	2.9	2.6	2.5	-	1.7	-	4.2	-	3.2
17 years-----	15.5	1.9	1.8	-	-	-	2.4	2.3	2.5	2.7	1.9

Table 3. Prevalence rates for selected conditions of the pupils and irides observed on direct examination of youths age 12-17 years, by type of condition, age, and sex: United States, 1966-70

Age and sex	Total with abnormal pupils or irides	Anisocoria	Limbic ring	Cataract	Lens opacity	Aphakia	Slow or unresponsive	Photosensitive	Blind eye	Scar from injury	Medication for injury	Depigmented iris	Other
Rate per 1,000 youths													
<u>Both sexes</u>													
12-17 years---	9.6	2.3	1.3	0.8	0.2	0.1	0.6	0.9	-	0.4	0.7	0.9	1.3
12 years-----	10.4	5.3	3.1	1.1	-	-	-	-	-	-	-	0.8	0.1
13 years-----	9.0	2.3	0.7	0.6	-	-	-	0.7	-	0.7	1.0	2.0	0.1
14 years-----	9.6	2.4	1.5	1.8	-	-	0.7	-	-	0.6	0.7	0.6	1.3
15 years-----	7.9	0.9	0.7	0.7	-	-	0.5	1.6	-	-	2.5	-	1.0
16 years-----	7.2	-	0.8	-	0.7	1.0	1.7	-	-	1.0	-	1.0	1.0
17 years-----	13.7	2.9	1.2	0.6	0.8	-	0.7	3.6	-	-	-	1.0	2.9
<u>Boys</u>													
12-17 years---	11.2	2.9	1.2	0.6	0.5	0.3	0.4	0.5	-	0.7	0.9	1.2	1.7
12 years-----	13.3	8.8	4.4	-	-	-	-	-	-	-	-	-	0.1
13 years-----	13.3	1.4	1.4	-	-	-	-	1.4	-	1.4	2.0	4.0	-
14 years-----	11.1	3.5	-	1.5	-	-	-	-	-	1.2	1.5	1.2	2.2
15 years-----	8.7	-	1.4	1.3	-	-	1.1	1.5	-	-	1.7	-	1.7
16 years-----	7.5	-	-	-	1.5	2.0	-	-	-	2.0	-	2.0	-
17 years-----	12.9	3.2	-	1.2	1.7	-	1.5	-	-	-	-	-	5.3
<u>Girls</u>													
12-17 years---	8.0	1.7	1.5	0.9	-	-	0.8	1.4	-	-	0.5	0.6	0.6
12 years-----	7.5	1.7	1.7	2.2	-	-	-	-	-	-	-	1.7	0.2
13 years-----	4.5	3.2	-	1.3	-	-	-	-	-	-	-	-	-
14 years-----	8.0	1.2	3.2	2.1	-	-	1.4	-	-	-	-	-	0.1
15 years-----	7.2	1.9	-	-	-	-	-	1.8	-	-	3.4	-	0.1
16 years-----	6.9	-	1.6	-	-	-	3.5	-	-	-	-	-	1.8
17 years-----	14.5	2.6	2.4	-	-	-	-	7.2	-	-	-	2.1	0.2
Standard errors													
Total-----	2.3	0.6	1.3	0.3	0.1	0.1	0.3	0.5	-	0.2	0.4	0.4	0.4
Boys-----	3.3	0.8	1.2	0.4	0.3	0.3	0.3	0.3	-	0.4	0.6	0.6	0.8
Girls-----	1.9	0.7	1.5	0.6	-	-	0.4	0.9	-	-	0.5	0.4	0.2

Table 4. Prevalence rates for selected conditions of the extraocular muscles observed on direct examination of youths age 12-17 years, by type of condition, age, and sex: United States, 1966-70

Age and sex	Tropia (manifest strabismus)	All other extraocular muscle conditions					
		Total ¹	Latent strabismus	Paralyzed muscles	Weakened muscles	Palsied muscles	Nystagmus
<u>Both sexes</u>		Rate per 1,000 youths					
12-17 years-----	34.5	18.3	4.7	6.1	2.4	0.7	5.1
12 years-----	31.4	15.4	4.1	2.8	2.5	1.4	4.5
13 years-----	34.9	18.3	4.7	5.2	4.2	-	5.0
14 years-----	35.6	16.5	4.2	6.1	2.2	1.3	3.4
15 years-----	28.1	16.5	2.5	6.4	0.9	1.1	5.6
16 years-----	32.9	27.5	6.7	10.5	2.3	-	9.2
17 years-----	44.7	16.0	5.8	6.0	2.1	-	3.0
<u>Boys</u>							
12-17 years-----	38.8	18.9	6.0	5.5	2.9	0.6	4.9
12 years-----	28.8	16.5	4.3	5.6	5.0	-	1.6
13 years-----	37.0	16.7	7.9	3.0	3.1	-	5.6
14 years-----	38.0	20.5	8.4	6.5	1.3	1.6	4.2
15 years-----	31.6	17.5	1.4	4.2	1.7	2.2	7.9
16 years-----	43.9	22.6	6.0	5.9	4.5	-	8.6
17 years-----	55.6	17.9	8.3	8.2	1.5	-	1.7
<u>Girls</u>							
12-17 years-----	30.1	17.5	3.2	6.7	1.9	0.7	5.3
12 years-----	34.0	12.1	3.9	-	-	2.9	7.5
13 years-----	32.8	17.1	1.4	7.5	5.4	-	4.4
14 years-----	33.2	12.4	-	5.7	3.2	0.9	2.7
15 years-----	24.5	15.4	3.6	8.6	-	-	3.2
16 years-----	21.7	32.7	7.5	15.3	-	-	9.9
17 years-----	33.6	14.1	3.4	3.7	2.7	-	4.3

¹0.6 youths per 1,000 have more than one type of these conditions.

Table 5. Prevalence rates for other eye conditions observed on direct examination of youths age 12-17 years, by type of condition, age, and sex: United States, 1966-70

Age and sex	Total with other abnormality	Extensive scarring	Double vision	Light perception only	Blind eye	Amblyopia	Optic-neuritis	Under-developed orb	Ptosis	Prominent eye	Other
<u>Both sexes</u>											
Rate per 1,000 youths											
12-17 years-----	4.8	0.6	0.1	0.4	0.4	0.4	0.2	0.4	0.1	0.1	2.1
12 years-----	6.5	-	0.6	-	-	1.1	-	1.0	-	-	3.9
13 years-----	4.1	-	-	0.7	0.6	-	-	0.7	-	-	2.1
14 years-----	5.0	2.2	-	-	0.7	-	-	-	-	0.7	0.9
15 years-----	5.8	1.4	-	-	1.3	1.1	1.3	-	-	-	0.8
16 years-----	3.4	-	-	0.8	-	-	-	0.6	0.8	-	2.0
17 years-----	3.6	-	-	0.9	-	-	-	-	-	-	2.8
<u>Boys</u>											
12-17 years-----	6.3	1.0	0.2	0.5	0.4	0.4	0.4	0.2	-	0.2	3.0
12 years-----	8.7	-	1.1	-	-	-	-	-	-	-	0.8
13 years-----	4.3	-	-	1.5	-	-	-	1.4	-	-	1.5
14 years-----	6.1	3.2	-	-	-	-	-	-	-	1.3	1.7
15 years-----	11.5	2.7	-	-	2.5	2.2	2.6	-	-	-	1.5
16 years-----	1.9	-	-	-	-	-	-	-	-	-	1.9
17 years-----	4.9	-	-	1.7	-	-	-	-	-	-	3.2
<u>Girls</u>											
12-17 years-----	3.2	0.2	-	0.2	0.5	0.4	-	0.6	0.3	-	1.1
12 years-----	4.2	-	-	-	-	2.3	-	2.0	-	-	-
13 years-----	3.9	-	-	-	1.3	-	-	-	-	-	2.6
14 years-----	3.8	1.1	-	1.2	1.5	-	-	-	-	-	-
15 years-----	-	-	-	-	-	-	-	-	-	-	-
16 years-----	4.9	-	-	-	-	-	-	1.3	1.6	-	2.0
17 years-----	2.3	-	-	-	-	-	-	-	-	-	2.3

Table 6. Prevalence rates for tropia (manifest strabismus) among youths age 12-17 years, by eye affected, direction of deviation, age, and sex: United States, 1966-70

Age and sex	Right eye	Left eye	Both eyes	Right eye			Left eye		
				In	Out	Unspecified	In	Out	Unspecified
<u>Both sexes</u>				Rate per 1,000 youths					
12-17 years-----	21.0	20.3	6.9	7.3	12.8	0.9	7.3	11.9	1.1
12 years-----	18.0	16.6	3.9	6.4	10.3	1.3	8.8	6.1	1.7
13 years-----	23.8	20.3	9.2	10.6	13.2	-	6.2	12.0	2.1
14 years-----	23.3	21.7	9.3	7.7	14.9	0.7	6.7	13.5	1.5
15 years-----	13.5	16.9	2.3	3.5	7.3	2.7	5.0	10.9	1.0
16 years-----	18.2	21.5	6.8	4.8	13.4	-	10.9	10.6	-
17 years-----	29.8	25.2	10.3	11.0	17.9	0.9	6.2	19.0	-
<u>Boys</u>									
12-17 years-----	26.5	21.0	9.0	9.5	16.3	0.7	8.7	11.9	0.4
12 years-----	18.6	14.1	5.0	6.7	10.9	1.0	11.0	3.1	-
13 years-----	24.0	20.2	7.2	15.1	8.9	-	9.8	7.6	2.8
14 years-----	27.7	17.9	7.6	9.5	18.2	-	11.1	6.8	-
15 years-----	17.3	19.0	4.6	4.5	9.3	3.5	6.5	12.5	-
16 years-----	28.8	27.0	11.9	8.0	20.8	-	10.3	16.7	-
17 years-----	45.0	29.3	18.7	13.2	31.8	-	2.8	26.5	-
<u>Girls</u>									
12-17 years-----	15.4	19.5	4.8	5.1	9.1	1.2	5.9	11.9	1.7
12 years-----	17.4	19.3	2.7	6.0	9.7	1.7	6.5	9.1	3.7
13 years-----	23.6	20.4	11.2	6.1	17.5	-	2.5	16.6	1.3
14 years-----	18.7	25.5	11.0	5.8	11.4	1.5	2.1	20.4	3.0
15 years-----	9.6	14.8	-	2.4	5.2	2.0	3.6	9.2	2.0
16 years-----	7.3	15.8	1.4	1.5	5.8	-	11.6	4.2	-
17 years-----	14.4	21.1	1.9	8.7	3.8	1.9	9.7	11.4	-
				Standard error					
Total-----	3.4	2.4	1.8	---	---	---	---	---	---
Boys-----	5.0	3.2	2.3	---	---	---	---	---	---
Girls-----	2.9	3.3	1.4	---	---	---	---	---	---

Table 7. Prevalence rates for all other (than tropia) extraocular muscle conditions among youths age 12-17 years, by eye affected, age, and sex: United States, 1966-70

Age and sex	Right eye	Left eye	Both eyes
<u>Both sexes</u>			
Rate per 1,000 youths			
12-17 years-----	12.3	14.0	8.4
12 years-----	11.8	10.6	6.9
13 years-----	14.1	11.4	8.1
14 years-----	13.8	11.1	8.8
15 years-----	9.0	14.7	7.2
16 years-----	15.1	25.1	13.4
17 years-----	9.8	12.1	5.9
<u>Boys</u>			
12-17 years-----	13.0	14.8	8.7
12 years-----	12.3	11.9	7.6
13 years-----	16.6	12.8	9.8
14 years-----	18.8	12.2	10.6
15 years-----	11.2	15.8	9.5
16 years-----	10.6	20.5	8.6
17 years-----	8.0	16.1	6.1
<u>Girls</u>			
12-17 years-----	11.5	13.3	8.0
12 years-----	11.3	9.2	6.1
13 years-----	11.5	10.1	6.2
14 years-----	8.5	9.9	6.9
15 years-----	6.7	13.6	4.9
16 years-----	19.7	29.7	18.4
17 years-----	11.6	8.1	5.6
Standard error			
Total-----	2.1	2.4	1.6
Boys-----	2.9	3.1	2.5
Girls-----	2.3	2.6	1.1

Table 8. Percent distribution of youths age 12-17 years with tropia (manifest strabismus) by degree and direction of uncorrected lateral phoria at distance and near, by age and sex: United States, 1966-70

Age and sex	Lateral phoria-distance			Lateral phoria-near		
	Esophoria (5 Δ +)	Normal (0-4 Δ)	Exophoria (5 Δ +)	Esophoria (6 Δ +)	Normal (5 Δ Lt.- 9 Δ Rt.)	Exophoria (10 Δ +)
<u>Both sexes</u>	Percent distribution					
12-17 years-----	38.9	56.5	4.6	30.5	49.9	19.6
12 years-----	50.5	46.9	2.6	58.8	36.6	4.6
13 years-----	43.4	53.4	3.2	34.0	38.6	27.4
14 years-----	53.4	42.8	3.8	28.7	35.7	35.6
15 years-----	24.5	71.5	4.0	18.6	65.7	15.7
16 years-----	26.9	62.1	11.0	26.9	51.0	22.1
17 years-----	31.1	64.2	4.7	14.7	71.3	14.0
<u>Boys</u>						
12-17 years-----	35.9	59.3	4.8	27.0	54.1	18.9
12 years-----	43.7	56.3	-	50.8	45.1	4.1
13 years-----	46.9	53.1	-	34.6	45.6	19.8
14 years-----	67.2	24.6	8.2	28.5	31.9	39.6
15 years-----	24.6	67.2	8.2	13.3	56.3	30.4
16 years-----	26.9	66.9	6.2	32.0	54.3	13.7
17 years-----	15.9	76.5	7.6	7.6	79.7	12.7
<u>Girls</u>						
12-17 years-----	42.3	53.4	4.3	34.7	44.9	20.4
12 years-----	58.1	36.3	5.6	67.1	27.7	5.2
13 years-----	39.7	53.6	6.7	33.4	30.3	36.3
14 years-----	41.4	58.6	-	28.9	38.9	32.2
15 years-----	24.3	75.7	-	24.3	75.7	-
16 years-----	27.0	51.9	21.1	14.8	43.3	41.9
17 years-----	55.2	44.8	-	26.0	57.9	16.1

Table 9. Percent distribution of youths age 12-17 years with other (than tropia) extraocular muscle conditions by degree and direction of uncorrected lateral phoria at distance and near, by age and sex: United States, 1966-70

Age and sex	Lateral phoria-distance			Lateral phoria-near		
	Esophoria (5 ^Δ +)	Normal (0-4 ^Δ)	Exophoria (5 ^Δ +)	Esophoria (6 ^Δ +)	Normal (5 ^Δ Lt.- 9 ^Δ Rt.)	Exophoria (10 ^Δ +)
<u>Both sexes</u>						
Percent distribution						
12-17 years-----	36.8	62.3	0.9	21.8	67.6	10.6
12 years-----	61.7	38.3	-	43.7	56.3	-
13 years-----	42.1	57.9	-	39.9	44.0	16.1
14 years-----	15.2	84.8	-	8.3	71.9	19.8
15 years-----	35.6	59.6	4.8	4.4	90.8	4.8
16 years-----	43.3	56.7	-	14.8	76.7	8.5
17 years-----	13.9	86.1	-	21.0	63.9	15.1
<u>Boys</u>						
12-17 years-----	38.2	60.1	1.7	24.4	65.6	10.0
12 years-----	55.4	44.6	-	49.3	50.7	-
13 years-----	54.5	45.5	-	58.5	33.2	8.3
14 years-----	16.9	83.1	-	7.0	77.9	15.1
15 years-----	28.5	62.2	9.3	-	90.7	9.3
16 years-----	62.3	37.7	-	15.9	69.1	15.0
17 years-----	12.7	87.3	-	12.7	74.6	12.7
<u>Girls</u>						
12-17 years-----	35.4	64.6	-	19.4	69.5	11.1
12 years-----	67.5	32.5	-	37.8	62.2	-
13 years-----	25.2	74.8	-	19.0	56.2	24.8
14 years-----	12.2	87.8	-	10.5	61.8	27.7
15 years-----	43.4	56.6	-	9.1	90.9	-
16 years-----	31.7	68.3	-	14.4	80.0	5.6
17 years-----	15.8	84.2	-	29.1	53.4	17.5

Table 10. Percent distribution of youths age 12-17 years with tropia (manifest strabismus) by degree and direction of lateral phoria at distance and near with own glasses, by age and sex: United States, 1966-70

Age and sex	Lateral phoria-distance			Lateral phoria-near		
	Esophoria (5 ^Δ +)	Normal (0-4 ^Δ)	Exophoria (5 ^Δ +)	Esophoria (6 ^Δ +)	Normal (5 ^Δ Lt.- 9 ^Δ Rt.)	Exophoria (10 ^Δ +)
<u>Both sexes</u>	Percent distribution					
12-17 years-----	36.7	55.0	8.3	38.8	48.9	12.3
12 years-----	65.9	34.1	-	66.6	28.0	5.4
13 years-----	40.7	51.4	7.9	38.6	43.1	18.3
14 years-----	21.3	70.0	8.7	24.2	60.7	15.1
15 years-----	34.6	55.5	9.9	32.1	60.5	7.4
16 years-----	43.8	50.1	6.1	53.5	40.9	5.6
17 years-----	18.3	65.0	16.7	24.3	59.0	16.7
<u>Boys</u>						
12-17 years-----	33.0	59.5	7.5	42.8	48.9	8.3
12 years-----	44.5	55.5	-	84.5	15.5	-
13 years-----	47.6	38.3	14.1	47.6	38.3	14.1
14 years-----	32.6	67.4	-	38.5	53.9	7.6
15 years-----	18.8	68.9	12.3	40.7	49.9	9.4
16 years-----	50.2	49.8	-	50.2	49.8	-
17 years-----	7.9	76.9	15.2	7.9	76.9	15.2
<u>Girls</u>						
12-17 years-----	41.9	48.5	9.6	33.5	48.9	17.6
12 years-----	88.8	11.2	-	47.5	41.3	11.2
13 years-----	32.2	67.8	-	27.4	49.0	23.6
14 years-----	8.1	73.1	18.8	6.7	69.0	24.3
15 years-----	100.0	-	-	-	100.0	-
16 years-----	35.9	50.5	13.6	56.9	31.5	11.6
17 years-----	34.5	46.3	19.2	49.9	30.9	19.2

Table 11. Percent distribution of youths age 12-17 years with other (than tropia) extraocular muscle conditions by degree and direction of lateral phoria at distance and near with own glasses, by age and sex: United States, 1966-70

Age and sex	Lateral phoria-distance			Lateral phoria-near		
	Esophoria (5 ^Δ +)	Normal (0-4 ^Δ)	Exophoria (5 ^Δ +)	Esophoria (6 ^Δ +)	Normal (5 ^Δ Lt.- 9 ^Δ Rt.)	Exophoria (10 ^Δ +)
<u>Both sexes</u>						
Percent distribution						
12-17 years-----	37.0	60.2	2.8	57.2	33.4	9.4
12 years-----	49.8	50.2	-	68.9	19.0	12.1
13 years-----	41.6	58.4	-	33.7	66.3	-
14 years-----	17.7	82.3	-	66.1	15.1	18.8
15 years-----	27.0	49.3	23.7	-	76.3	23.7
16 years-----	46.6	53.4	-	100.0	-	-
17 years-----	-	100.0	-	51.8	48.2	-
<u>Boys</u>						
12-17 years-----	34.8	60.4	4.8	61.0	28.1	10.9
12 years-----	31.0	69.0	-	63.3	16.3	20.4
13 years-----	31.4	68.6	-	53.1	46.9	-
14 years-----	-	100.0	-	77.5	22.5	-
15 years-----	36.6	31.4	32.0	-	68.0	32.0
16 years-----	67.9	32.1	-	100.0	-	-
17 years-----	-	-	-	-	-	-
<u>Girls</u>						
12-17 years-----	40.1	59.9	-	51.6	41.3	7.1
12 years-----	77.2	22.8	-	77.2	22.8	-
13 years-----	59.4	40.6	-	-	100.0	-
14 years-----	43.1	56.9	-	43.1	-	56.9
15 years-----	-	100.0	-	-	100.0	-
16 years-----	-	100.0	-	100.0	-	-
17 years-----	-	100.0	-	51.8	48.2	-

Table 12. Prevalence rates for tropia and for other extraocular muscle problems among youths age 12-17 years with at least "normal" and with defective uncorrected acuity at distance and near, by age and sex: United States, 1966-70

Age and sex	Tropia		Other eye muscle conditions		Tropia		Other eye muscle conditions	
	Distance acuity without glasses				Near acuity with own glasses			
	20/20 or better	20/40 or less	20/20 or better	20/40 or less	14/14 or better	14/35 or less	14/14 or better	14/35 or less
<u>Both sexes</u>								
Prevalence rates per 100 youths								
12-17 years-----	2.0	1.0	1.2	0.5	2.2	0.5	1.3	0.2
12 years-----	2.4	0.5	0.9	0.3	2.2	0.1	1.0	0.2
13 years-----	1.8	1.1	1.2	0.6	1.9	0.5	1.3	0.1
14 years-----	1.5	1.7	1.0	0.5	2.3	0.8	1.2	0.2
15 years-----	2.2	0.5	1.3	0.3	2.2	0.2	1.4	0.1
16 years-----	1.8	1.3	1.6	0.8	1.6	0.7	1.9	0.4
17 years-----	2.4	1.1	1.0	0.3	3.1	0.7	1.0	0.3
<u>Boys</u>								
12-17 years-----	2.3	1.1	1.3	0.5	2.5	0.6	1.4	0.3
12 years-----	2.6	0.3	1.1	0.5	2.3	0.2	1.2	0.3
13 years-----	2.2	0.9	1.2	0.4	2.4	0.4	1.4	0.1
14 years-----	1.3	1.8	1.2	0.6	2.4	0.5	1.6	0.3
15 years-----	2.1	0.8	1.4	0.3	2.2	0.2	1.4	-
16 years-----	2.8	1.3	1.1	0.7	2.6	0.7	1.3	0.7
17 years-----	2.9	1.8	1.3	0.4	3.4	1.3	1.1	0.3
<u>Girls</u>								
12-17 years-----	1.7	0.9	1.1	0.4	1.9	0.4	1.2	0.1
12 years-----	2.2	0.7	0.7	0.1	2.1	-	0.7	0.1
13 years-----	1.4	1.3	1.0	0.7	1.5	0.5	1.0	-
14 years-----	1.6	1.5	0.7	0.4	2.2	1.0	0.8	0.2
15 years-----	2.3	0.2	1.2	0.3	2.3	0.2	1.4	0.1
16 years-----	0.8	1.3	2.2	0.8	0.7	0.6	2.6	0.2
17 years-----	1.8	0.4	0.7	0.2	2.7	-	0.9	0.2

Table 13. Percent distribution of degree and type of lateral phoria among youths age 12-17 years with essentially normal or defective uncorrected binocular visual acuity at distance, by age and sex: United States, 1966-70

Age and sex	Binocular acuity of 20/20 or better-distance			Binocular acuity of 20/40 or less-distance		
	Esophoria (5 Δ +)	Normal (0-4 Δ)	Exophoria (5 Δ +)	Esophoria (5 Δ +)	Normal (0-4 Δ)	Exophoria (5 Δ +)
<u>Both sexes</u>	Percent distribution within acuity group					
12-17 years-----	17.5	80.7	1.8	9.5	89.7	0.8
12 years-----	21.8	75.6	2.6	10.5	88.6	0.9
13 years-----	17.8	81.5	0.7	10.1	89.4	0.5
14 years-----	20.3	77.6	2.1	8.8	90.4	0.8
15 years-----	15.5	83.1	1.4	10.2	89.7	0.1
16 years-----	14.0	84.6	1.4	9.0	89.4	1.6
17 years-----	17.2	80.2	2.6	8.2	90.7	1.1
<u>Boys</u>						
12-17 years-----	16.3	82.2	1.5	8.6	90.7	0.7
12 years-----	22.0	76.8	1.2	8.8	90.9	0.3
13 years-----	19.3	80.7	-	8.5	91.1	0.4
14 years-----	19.4	74.8	5.8	8.9	90.3	0.8
15 years-----	14.1	82.6	3.3	10.6	89.4	-
16 years-----	12.3	87.7	-	7.8	90.6	1.6
17 years-----	13.1	86.9	-	6.9	91.7	1.4
<u>Girls</u>						
12-17 years-----	18.3	79.7	2.0	10.6	88.5	0.9
12 years-----	21.7	74.5	3.8	12.4	86.2	1.4
13 years-----	16.8	82.1	1.1	12.1	87.2	0.7
14 years-----	20.8	79.2	-	8.7	90.6	0.7
15 years-----	16.5	83.5	-	9.8	90.0	0.2
16 years-----	15.2	82.3	2.5	10.5	87.8	1.7
17 years-----	19.7	76.1	4.2	9.9	89.5	0.6
	Standard error					
Total-----	1.71	1.53	0.43	0.50	0.51	0.13
Boys-----	2.14	2.11	0.59	0.58	0.61	0.13
Girls-----	2.12	2.18	0.56	0.79	0.87	0.29

Table 14. Percent distribution of degree and type of lateral phoria among youths age 12-17 years with essentially normal or defective uncorrected binocular near visual acuity, by age and sex: United States, 1966-70

Age and sex	Binocular acuity of 14/14 or better-near			Binocular acuity of less than 14/35-near		
	Esophoria (6 Δ +))	Normal (5 Δ Lt.-9 Δ Rt.)	Exophoria (10 Δ +))	Esophoria (6 Δ +))	Normal (5 Δ Lt.-9 Δ Rt.)	Exophoria (10 Δ +))
<u>Both sexes</u>	Percent distribution within acuity groups					
12-17 years-----	4.4	87.9	7.7	7.1	31.0	61.9
12 years-----	4.7	89.3	6.0	11.3	40.6	48.1
13 years-----	5.6	86.8	7.6	4.5	38.4	57.1
14 years-----	4.8	87.7	7.5	8.4	24.9	66.7
15 years-----	3.4	89.3	7.3	14.5	38.4	47.1
16 years-----	4.0	86.8	9.2	5.2	7.3	87.5
17 years-----	4.1	86.9	9.0	-	38.2	61.8
<u>Boys</u>						
12-17 years-----	4.8	87.7	7.5	5.5	28.2	66.3
12 years-----	4.0	89.8	6.2	20.6	26.8	52.6
13 years-----	7.2	86.2	6.6	-	52.5	47.5
14 years-----	5.3	87.8	6.9	-	23.7	76.3
15 years-----	3.3	87.3	9.4	7.6	38.2	54.2
16 years-----	3.7	88.4	7.9	6.2	4.4	89.4
17 years-----	5.2	86.7	8.1	-	28.7	71.3
<u>Girls</u>						
12-17 years-----	4.0	88.0	8.0	8.1	32.8	59.1
12 years-----	5.4	88.7	5.9	5.0	50.0	45.0
13 years-----	3.8	87.6	8.6	7.1	30.3	62.6
14 years-----	4.2	87.6	8.2	11.8	25.2	63.0
15 years-----	3.6	91.4	5.0	18.4	38.6	43.0
16 years-----	4.3	85.1	10.6	4.2	10.3	85.5
17 years-----	2.9	87.1	10.0	-	47.6	52.4
	Standard error					
Total-----	0.28	0.54	0.59	1.56	4.34	3.74
Boys-----	0.27	0.53	0.47	3.10	7.52	6.66
Girls-----	0.47	0.93	0.92	2.26	3.98	4.82

Table 15. Prevalence rates for principal infectious and functional eye abnormalities observed on direct examination of white and Negro youths age 12-17 years, by general type of condition, age, and sex: United States, 1966-70; with selected rates for white and Negro children age 6-11 years: United States, 1963-65

Abnormality and race	Both sexes							Boys 12-17 years	Girls 12-17 years	12-17 years		
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years			Both sexes	Boys	Girls
	Rate per 1,000 youths									Standard errors		
Any eye abnormality:												
White-----	75.8	73.5	77.0	77.4	56.6	83.8	87.8	84.9	66.5	6.0	6.7	7.9
Negro-----	103.9	136.4	80.5	65.3	125.9	109.2	108.1	122.8	85.4	16.1	28.0	16.7
Lids, sclerae, conjunctivae:												
White-----	19.3	21.2	15.9	22.8	10.9	23.3	21.7	25.6	12.7	1.8	3.5	1.7
Negro-----	36.0	54.6	48.6	9.3	36.5	29.0	35.7	36.0	35.9	9.5	13.8	9.2
Pupils, irides:												
White-----	9.1	10.5	10.4	9.3	6.4	8.3	9.7	10.9	7.3	2.6	3.5	2.0
Negro-----	13.0	10.5	-	11.7	18.7	-	40.2	13.3	12.7	5.7	8.4	7.3
Tropia (manifest strabismus):												
White-----	35.0	31.6	38.8	35.9	25.3	31.0	48.0	37.2	32.7	4.5	5.5	5.5
Negro-----	32.5	31.2	11.3	34.9	49.0	46.5	24.5	50.7	14.7	12.9	23.0	4.7
All other extraocular muscle conditions:												
White-----	16.5	12.7	17.7	15.3	13.0	24.6	16.0	17.1	15.8	3.2	4.1	3.3
Negro-----	28.2	32.9	16.8	21.1	41.3	41.5	16.6	32.9	23.5	9.2	10.0	10.7
Latent strabismus:												
White-----	3.9	2.8	4.6	4.0	1.0	5.4	6.0	5.0	2.8	1.5	1.9	1.5
Negro-----	9.7	12.2	6.0	5.9	13.2	15.9	5.3	13.4	6.1	3.8	4.6	3.6
	Both sexes							Boys 6-11 years	Girls 6-11 years	6-11 years		
Abnormality and race	6-11 years	6 years	7 years	8 years	9 years	10 years	11 years			Both sexes	Boys	Girls
	Rate per 1,000 children									Standard errors		
Any eye abnormality:												
White-----	129.0	109.3	111.6	144.8	127.3	140.4	142.4	115.5	143.0	29.9	27.4	32.9
Negro-----	90.2	58.4	89.7	101.1	123.3	91.3	78.3	95.9	84.4	8.4	12.4	13.7
Tropia (manifest strabismus):												
White-----	24.3	19.3	25.8	32.9	21.6	20.2	26.2	23.6	25.1	2.8	2.9	3.7
Negro-----	21.3	16.2	11.1	21.2	26.9	21.5	32.4	27.5	15.0	3.7	7.5	5.9
Latent strabismus(confirmed):												
White-----	45.7	41.8	35.2	53.0	45.8	49.5	49.4	37.2	54.5	9.7	9.3	10.8
Negro-----	28.5	-	32.2	60.5	31.4	22.7	24.1	29.0	28.0	5.5	8.9	7.0

Table 16. Prevalence rates for principal infectious and functional eye abnormalities observed on direct examination of youths age 12-17 years, by general type of condition, age, sex, and geographic region: United States, 1966-70; with selected rates for children age 6-11 years by geographic region: United States, 1963-65

Abnormality and geographic region	Both sexes							Boys 12-17 years	Girls 12-17 years	12-17 years		
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years			Both sexes	Boys	Girls
	Rate per 1,000 youths									Standard errors		
Any eye abnormality:												
Northeast-----	69.5	56.4	64.9	80.4	57.2	71.6	89.6	82.1	56.6	9.6	17.8	10.3
Midwest-----	86.6	95.2	100.1	79.3	73.8	80.3	88.8	93.5	79.7	11.6	13.0	12.3
South-----	81.2	88.5	74.7	84.7	53.3	99.0	89.6	92.4	69.6	14.5	18.9	12.8
West-----	77.4	84.4	63.4	58.1	72.5	94.9	92.0	88.2	66.4	19.6	16.6	24.8
Lids, sclerae, conjunctivae:												
Northeast-----	29.1	32.6	25.3	27.7	28.8	23.1	37.6	41.0	17.0	11.3	17.8	5.7
Midwest-----	13.6	14.7	17.0	14.3	7.9	12.4	15.2	16.6	10.7	1.7	3.5	2.4
South-----	28.0	37.1	26.9	25.6	13.8	32.4	33.7	33.9	21.8	3.7	6.7	1.7
West-----	17.2	22.1	13.5	17.5	8.8	29.4	11.4	19.4	15.0	2.9	5.1	8.3
Pupils, irides:												
Northeast-----	6.8	2.4	-	15.6	4.1	-	20.1	7.7	5.8	3.2	4.8	4.0
Midwest-----	6.1	5.0	7.0	3.8	8.5	6.5	5.7	7.3	4.9	1.5	2.5	3.2
South-----	8.7	9.8	7.1	3.0	12.8	3.7	16.4	6.4	11.2	2.3	2.0	3.3
West-----	16.7	24.4	21.3	16.8	5.6	16.8	14.8	22.9	10.4	8.2	11.5	5.3
Tropia (manifest strabismus):												
Northeast-----	26.4	12.0	29.3	40.0	16.8	34.5	26.9	26.5	26.3	6.8	8.9	9.1
Midwest-----	50.6	57.4	53.9	44.2	47.0	35.8	65.0	55.6	45.7	13.1	14.0	13.6
South-----	28.8	22.5	31.7	37.4	9.7	36.3	36.4	36.3	21.0	6.9	11.0	6.8
West-----	28.6	27.4	20.2	20.5	34.6	25.7	44.3	33.0	24.0	7.2	10.8	6.9
All other extraocular muscle conditions:												
Northeast-----	9.3	6.8	6.6	19.2	4.1	13.9	4.6	6.8	11.8	2.6	3.5	3.4
Midwest-----	15.6	12.6	22.0	16.8	5.2	30.4	6.3	15.1	16.2	3.7	7.3	5.3
South-----	25.0	21.2	12.1	25.4	29.8	29.7	32.0	28.8	21.1	10.5	10.3	10.8
West-----	21.5	21.7	27.0	3.1	25.9	30.1	21.3	25.1	17.9	11.2	10.9	13.4
Latent strabismus:												
Northeast-----	1.1	-	-	-	-	3.0	4.6	-	2.3	1.0	-	2.1
Midwest-----	3.3	2.9	2.7	7.1	-	7.3	-	5.6	1.0	0.8	1.7	1.3
South-----	10.1	12.5	6.4	9.3	10.2	12.7	9.7	10.6	9.6	5.5	5.8	5.4
West-----	4.2	2.2	10.0	-	-	3.6	9.9	7.5	0.8	2.4	4.4	1.0

Table 16. Prevalence rates for principal infectious and functional eye abnormalities observed on direct examination of youths age 12-17 years, by general type of condition, age, sex, and geographic region: United States, 1966-70; with selected rates for children age 6-11 years by geographic region: United States, 1963-65—Con.

Abnormality and geographic region	Both sexes							Boys 6-11 years	Girls 6-11 years	6-11 years		
	6-11 years	6 years	7 years	8 years	9 years	10 years	11 years			Both sexes	Boys	Girls
	Rate per 1,000 children								Standard errors			
Any eye abnormality:												
Northeast-----	123.6	93.8	103.8	166.6	116.5	125.1	137.6	118.7	128.5	18.8	19.3	22.2
Midwest-----	114.5	85.2	99.0	120.8	121.6	137.2	121.4	102.1	127.3	10.4	12.0	13.5
South-----	83.6	60.9	77.3	80.1	77.2	100.2	107.6	66.5	100.7	9.8	8.0	15.3
West-----	172.5	162.7	155.2	179.7	199.4	166.3	173.8	160.7	185.5	117.7	103.9	132.8
Tropia (manifest strabismus):												
Northeast-----	30.1	24.5	31.0	38.2	24.8	18.3	43.2	27.4	32.8	5.1	6.9	6.8
Midwest-----	22.9	18.2	21.6	19.0	26.5	33.7	17.8	22.9	23.0	2.9	2.9	4.0
South-----	22.3	17.4	21.9	31.9	19.2	12.9	31.6	20.4	24.2	4.1	3.3	5.5
West-----	20.5	15.5	20.9	36.9	17.0	13.1	18.6	25.7	14.7	5.9	6.9	6.5
Latent strabismus (confirmed):												
Northeast-----	56.1	37.8	32.9	89.3	46.6	69.1	63.8	51.2	61.1	14.8	15.4	17.6
Midwest-----	43.4	26.6	44.2	47.5	44.0	50.6	46.1	32.2	55.0	4.9	7.6	5.7
South-----	21.7	9.4	15.6	25.7	15.7	32.0	33.5	15.5	27.9	6.7	6.6	9.1
West-----	52.8	67.3	44.0	51.9	76.5	34.5	42.2	45.9	60.4	35.9	30.9	41.5

Table 17. Prevalence rates for principal infectious and functional eye abnormalities observed on direct examination of youths age 12-17 years, by general type of condition, age, sex, and annual family income: United States, 1966-70; with selected rates for children age 6-11 years by annual family income: United States, 1963-65

Abnormality and family income	Both sexes							Boys 12-17 years	Girls 12-17 years
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years		
Rate per 1,000 youths									
Any eye abnormality:									
Less than \$5,000-----	105.7	122.4	101.4	81.9	98.3	115.5	118.3	116.5	95.3
\$5,000-\$9,999-----	69.4	66.0	62.4	70.3	63.0	78.6	78.6	83.6	54.1
\$10,000 or more-----	70.0	75.9	79.7	71.8	48.4	74.9	69.4	72.7	67.3
Lids, sclerae, conjunctivae:									
Less than \$5,000-----	27.5	27.8	34.9	20.3	21.4	22.6	38.4	31.1	24.1
\$5,000-\$9,999-----	20.4	19.4	19.2	22.0	12.5	28.8	21.3	26.6	13.8
\$10,000 or more-----	18.4	32.9	10.0	18.3	12.3	20.6	15.4	23.9	12.9
Pupils, irides:									
Less than \$5,000-----	17.6	22.7	14.0	12.9	15.1	11.8	29.8	22.7	12.7
\$5,000-\$9,999-----	6.9	4.4	6.1	8.5	8.8	4.9	9.1	5.8	8.0
\$10,000 or more-----	6.1	10.1	7.6	5.8	2.4	5.7	4.6	8.3	3.8
Tropia (manifest strabismus):									
Less than \$5,000-----	33.2	40.9	30.4	32.2	40.2	39.1	26.5	39.1	27.6
\$5,000-\$9,999-----	30.8	26.4	25.0	29.4	29.0	32.0	46.4	37.5	23.6
\$10,000 or more-----	49.3	31.2	51.6	41.2	30.8	34.9	46.7	37.7	40.8
All other extraocular muscle conditions:									
Less than \$5,000-----	37.0	39.8	28.5	21.8	47.0	44.8	41.9	36.7	37.3
\$5,000-\$9,999-----	12.8	10.7	13.0	18.2	9.4	20.3	5.0	15.8	9.6
\$10,000 or more-----	7.8	1.8	12.6	9.9	-	13.4	9.7	6.1	9.6
Latent strabismus:									
Less than \$5,000-----	9.2	10.7	8.3	-	9.8	13.6	13.6	9.7	8.8
\$5,000-\$9,999-----	4.7	2.1	6.5	9.1	-	7.5	2.6	7.6	1.5
\$10,000 or more-----	0.4	-	-	-	-	-	2.2	-	0.7
Rate per 1,000 children									
Both sexes									
Abnormality and family income	6-11 years	6 years	7 years	8 years	9 years	10 years	11 years	Boys 6-11 years	Girls 6-11 years
Any eye abnormality:									
Less than \$5,000-----	133.4	126.3	132.1	127.4	129.3	149.3	137.4	122.9	143.8
\$5,000-\$9,999-----	117.5	88.5	92.6	146.9	139.5	115.5	123.8	104.7	130.7
\$10,000 or more-----	115.2	61.6	111.5	120.9	93.4	141.6	160.7	102.1	130.1
Tropia (manifest strabismus):									
Less than \$5,000-----	22.4	20.5	22.6	25.8	27.4	14.1	24.6	24.4	20.5
\$5,000-\$9,999-----	19.9	14.6	19.6	31.0	16.9	15.9	21.0	19.8	20.0
\$10,000 or more-----	32.3	19.1	41.1	31.1	21.4	33.1	48.9	29.0	36.1
Latent strabismus (confirmed):									
Less than \$5,000-----	43.0	42.1	45.9	44.9	35.9	52.0	36.8	37.1	48.8
\$5,000-\$9,999-----	44.1	37.7	31.9	52.2	52.6	41.6	50.0	33.5	55.2
\$10,000 or more-----	39.5	7.6	20.8	63.7	40.1	47.9	54.2	35.3	44.3

Table 18. Prevalence rates for principal infectious and functional eye abnormalities observed on direct examination of white youths age 12-17 years, by general type of condition, age, sex, and geographic region: United States, 1966-70

Abnormality and geographic region	Both sexes							Boys 12-17 years	Girls 12-17 years	12-17 years		
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years			Both sexes	Boys	Girls
	Rate per 1,000 white youths									Standard errors		
Any eye abnormality:												
Northeast-----	59.2	36.0	57.3	76.9	52.2	66.2	69.6	71.5	45.9	12.5	19.7	11.3
Midwest-----	84.3	91.2	94.2	78.3	72.2	78.2	89.6	93.2	75.3	13.3	14.4	13.5
South-----	75.9	59.6	72.3	95.0	34.0	97.2	100.1	85.3	66.0	11.8	14.6	13.0
West-----	71.7	81.7	67.7	60.0	45.3	93.4	82.3	81.3	62.0	19.8	16.4	24.0
Lids, sclerae, conjunctivae:												
Northeast-----	25.2	23.1	21.6	28.3	28.3	17.0	33.7	37.0	12.5	7.7	13.4	2.7
Midwest-----	14.0	16.1	15.7	15.6	5.8	13.7	16.5	17.2	10.7	1.4	3.8	2.2
South-----	25.5	27.2	11.2	31.8	6.6	44.3	33.2	34.2	16.4	3.5	6.1	2.5
West-----	15.6	21.3	14.4	19.1	6.0	23.2	9.0	18.9	12.3	2.8	5.2	6.2
Pupils, irides:												
Northeast-----	2.8	2.8	-	9.8	-	-	4.0	3.3	2.3	1.5	1.7	1.6
Midwest-----	5.6	2.2	7.6	4.2	9.5	7.2	3.0	7.0	4.2	0.7	2.9	2.5
South-----	9.7	13.6	10.3	4.1	9.1	5.0	16.8	7.6	12.0	2.2	1.8	3.7
West-----	17.8	24.3	22.7	18.3	6.1	18.1	16.5	24.2	11.3	8.9	12.4	5.7
Tropia (manifest strabismus):												
Northeast-----	28.8	14.0	34.3	41.7	19.1	33.2	31.1	26.7	31.0	7.2	9.2	10.1
Midwest-----	53.1	62.8	52.6	48.1	48.5	35.6	70.4	58.6	47.6	15.0	16.4	15.6
South-----	27.8	12.4	45.9	33.4	2.8	27.0	47.8	31.7	23.6	4.4	8.6	7.3
West-----	25.1	24.5	21.6	19.1	23.3	27.6	35.8	26.5	23.7	7.1	9.2	7.4
All other extraocular muscle conditions:												
Northeast-----	10.0	4.0	7.7	21.9	4.7	15.8	5.3	7.7	12.4	3.2	3.9	4.9
Midwest-----	11.1	8.0	18.1	10.3	2.8	23.0	3.6	9.2	12.9	4.2	7.6	3.8
South-----	23.7	15.3	12.7	30.4	19.5	25.2	38.7	26.8	20.4	10.2	9.9	10.9
West-----	22.5	23.9	28.8	3.4	25.3	32.4	20.8	26.5	18.5	12.1	11.6	14.6
Latent strabismus:												
Northeast-----	1.3	-	-	-	-	3.5	5.3	-	2.7	1.2	-	2.5
Midwest-----	1.2	-	-	7.8	-	-	-	2.5	-	1.3	2.6	-
South-----	10.6	12.0	9.3	8.3	4.7	17.4	12.8	9.8	11.4	5.4	5.2	5.9
West-----	4.1	2.4	10.7	-	-	3.9	8.0	8.2	-	2.4	5.0	-

Table 19. Prevalence rates for principal infectious and functional eye abnormalities observed on direct examination of Negro youths age 12-17 years, by general type of condition, age, sex, and geographic region: United States, 1966-70

Abnormality and geographic region	Both sexes							Boys 12-17 years	Girls 12-17 years	12-17 years		
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years			Both sexes	Boys	Girls
	Rate per 1,000 Negro youths									Standard errors		
Any eye abnormality:												
Northeast-----	100.6	116.6	47.0	81.3	69.0	115.3	186.5	132.3	76.6	46.7	64.8	41.8
Midwest-----	104.1	103.1	202.6	89.5	99.7	103.5	37.2	101.5	107.1	26.3	28.3	62.7
South-----	95.6	163.0	80.0	57.1	111.6	103.7	56.4	112.2	78.9	23.9	38.5	21.8
West-----	138.6	125.8	-	40.9	311.2	131.0	215.6	173.9	99.1	63.6	88.7	74.9
Lids, sclerae, conjunctivae:												
Northeast-----	55.9	92.6	47.0	23.9	33.3	70.3	62.7	73.9	42.3	40.8	64.0	25.5
Midwest-----	10.8	-	37.9	-	31.0	-	-	10.2	11.3	7.4	10.2	12.1
South-----	34.7	62.3	62.0	9.0	35.6	-	35.1	33.4	36.0	6.5	11.8	6.1
West-----	41.2	34.1	-	-	53.9	131.0	39.7	29.2	54.5	23.9	29.8	51.1
Pupils, iridis:												
Northeast-----	33.7	-	-	57.4	35.7	-	123.8	44.2	25.9	25.5	44.9	24.4
Midwest-----	12.2	36.8	-	-	-	-	37.2	10.8	13.8	13.7	10.7	18.0
South-----	6.0	-	-	-	24.2	-	15.3	3.0	9.1	4.6	3.4	7.4
West-----	5.8	28.1	-	-	-	-	-	11.1	-	5.6	10.8	-
Tropia (manifest strabismus):												
Northeast-----	10.8	-	-	28.7	-	45.0	-	25.1	-	7.8	19.5	-
Midwest-----	25.6	-	82.8	-	37.7	39.4	-	25.8	25.5	7.5	18.6	8.8
South-----	31.6	48.3	-	48.0	30.8	61.6	-	49.0	14.0	18.0	32.8	7.8
West-----	79.1	63.6	-	40.9	213.8	-	144.2	121.5	31.7	52.2	87.1	16.8
All other extraocular muscle conditions:												
Northeast-----	10.0	50.2	-	-	-	-	-	-	17.5	6.0	-	10.5
Midwest-----	68.5	66.2	81.8	89.5	31.0	103.5	37.2	79.2	56.4	23.1	12.2	47.3
South-----	28.5	36.4	10.8	12.2	61.1	42.1	10.8	34.1	22.9	19.4	22.1	19.5
West-----	12.3	-	-	-	43.4	-	31.6	12.0	12.7	12.0	11.9	12.3
Latent strabismus:												
Northeast-----	-	-	-	-	-	-	-	-	-	-	-	-
Midwest-----	27.1	36.8	43.9	-	-	78.8	-	38.8	13.8	15.9	13.4	18.0
South-----	8.8	13.7	-	12.2	27.0	-	-	12.8	4.8	6.8	8.7	5.1
West-----	6.0	-	-	-	-	-	31.6	-	12.7	5.8	-	12.3

Table 20. Prevalence rates for principal infectious and functional eye abnormalities observed on direct examination of white youths age 12-17 years by general type of condition, age, sex, and annual family income: United States, 1966-70; with selected rates for white children age 6-11 years by annual family income: United States, 1963-65

Abnormality and family income	Both sexes							Boys 12-17 years	Girls 12-17 years
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years		
Rate per 1,000 white youths									
Any eye abnormality:									
Less than \$5,000-----	104.2	96.9	103.0	89.9	90.0	122.5	128.4	118.3	91.0
\$5,000-\$9,999-----	65.0	63.3	60.8	73.2	49.8	73.7	70.3	76.3	52.8
\$10,000 or more-----	65.4	68.1	76.5	66.8	40.4	70.3	70.7	69.6	61.2
Lids, sclerae, conjunctivae:									
Less than \$5,000-----	23.4	13.8	19.3	22.3	16.5	32.5	40.4	28.2	19.1
\$5,000-\$9,999-----	19.7	17.9	19.1	24.4	10.4	27.2	19.8	26.0	12.9
\$10,000 or more-----	16.9	31.3	10.2	18.9	9.9	14.3	16.3	23.7	10.1
Pupils, irides:									
Less than \$5,000-----	20.4	29.7	21.0	18.9	13.2	17.0	22.3	29.5	11.9
\$5,000-\$9,999-----	6.4	4.8	6.8	4.7	7.2	5.5	9.9	4.1	8.9
\$10,000 or more-----	5.7	7.5	7.8	6.0	2.4	5.8	4.7	8.5	2.9
Tropia (manifest strabismus):									
Less than \$5,000-----	35.7	43.6	40.8	28.6	28.0	38.6	34.3	38.0	33.5
\$5,000-\$9,999-----	28.6	25.3	25.8	30.2	22.2	26.5	43.4	33.0	23.8
\$10,000 or more-----	40.8	32.5	52.8	42.5	32.1	36.1	49.2	38.9	42.7
All other extraocular muscle conditions:									
Less than \$5,000-----	39.2	37.1	34.5	28.0	46.0	38.3	53.1	39.3	39.2
\$5,000-\$9,000-----	12.6	9.6	12.2	20.1	8.2	19.6	5.4	15.2	9.7
\$10,000 or more-----	6.9	1.9	12.9	5.4	-	13.9	7.9	4.7	9.2
Latent strabismus:									
Less than \$5,000-----	10.0	10.9	12.5	-	4.8	13.3	20.1	9.0	11.0
\$5,000-\$9,999-----	3.8	-	4.9	10.1	-	5.3	2.8	6.7	0.8
\$10,000 or more-----	-	-	-	-	-	-	-	-	-
Rate per 1,000 white children									
Abnormality and family income	Both sexes							Boys 6-11 years	Girls 6-11 years
	6-11 years	6 years	7 years	8 years	9 years	10 years	11 years		
Any eye abnormality:									
Less than \$5,000-----	146.5	149.8	139.7	126.0	139.9	170.7	153.3	130.2	162.4
\$5,000-\$9,999-----	121.6	95.0	98.6	156.0	130.9	121.6	130.1	108.4	135.3
\$10,000 or more-----	113.8	62.1	107.8	123.2	94.6	132.2	161.6	99.5	130.2
Tropia (manifest strabismus):									
Less than \$5,000-----	21.9	20.5	25.1	24.2	26.9	16.1	18.0	23.4	20.4
\$5,000-\$9,999-----	20.6	15.7	21.3	33.5	16.3	14.4	21.9	19.6	21.7
\$10,000 or more-----	31.7	19.2	41.8	31.7	21.7	27.6	49.2	27.4	36.6
Latent strabismus (confirmed):									
Less than \$5,000-----	48.2	58.9	48.9	31.5	41.2	63.8	43.3	37.8	58.3
\$5,000-\$9,999-----	45.4	40.5	32.8	55.0	48.0	44.7	53.2	35.8	55.4
\$10,000 or more-----	39.0	7.7	21.1	65.0	40.7	43.0	54.5	33.9	44.9

Table 21. Prevalence rates for principal infectious and functional eye abnormalities observed on direct examination of Negro youths age 12-17 years by general type of condition, age, sex, and annual family income: United States, 1966-70; with selected rates for Negro children age 6-11 years by annual family income: United States, 1963-65

Abnormality and family income	Both sexes							Boys 12-17 years	Girls 12-17 years
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years		
Rate per 1,000 Negro youths									
Any eye abnormality:									
Less than \$5,000-----	105.7	161.4	98.8	64.5	108.2	99.5	98.8	114.3	97.1
\$5,000-\$9,999-----	99.4	89.9	60.9	45.3	169.1	128.4	108.3	145.9	51.1
\$10,000 or more-----	123.5	178.7	-	156.7	93.0	226.6	52.3	97.6	142.7
Lids, sclerae, conjunctivae:									
Less than \$5,000-----	36.8	59.1	67.0	16.1	34.3	-	34.8	37.8	35.7
\$5,000-\$9,999-----	28.1	32.7	21.2	-	33.3	45.4	38.6	33.6	22.4
\$10,000 or more-----	69.4	89.2	-	-	96.4	236.9	-	37.0	93.1
Pupils, irides:									
Less than \$5,000-----	11.5	7.5	-	-	20.1	-	45.9	8.5	14.5
\$5,000-\$9,999-----	11.3	-	-	45.3	23.3	-	-	22.1	-
\$10,000 or more-----	16.6	90.6	-	-	-	-	-	-	29.0
Tropia (manifest strabismus):									
Less than \$5,000-----	28.4	36.1	9.7	40.0	36.9	40.0	10.4	42.2	14.7
\$5,000-\$9,999-----	53.8	36.3	18.7	22.8	93.7	83.4	82.2	83.7	22.9
\$10,000 or more-----	-	-	-	-	-	-	-	-	-
All other extraocular muscle conditions:									
Less than \$5,000-----	32.8	46.7	16.9	8.5	51.0	59.6	19.1	31.9	33.6
\$5,000-\$9,999-----	16.0	21.1	21.6	-	20.5	27.7	-	23.3	8.4
\$10,000 or more-----	38.4	-	-	161.5	-	-	53.3	62.0	20.9
Latent strabismus:									
Less than \$5,000-----	7.5	10.7	-	-	22.5	14.1	-	11.2	3.9
\$5,000-\$9,999-----	12.6	21.1	21.6	-	-	27.7	-	16.6	8.4
\$10,000 or more-----	12.1	-	-	-	-	-	53.3	-	20.9
Rate per 1,000 Negro children									
Any eye abnormality:									
Less than \$5,000-----	99.6	67.5	114.0	130.9	99.9	94.4	94.7	104.7	94.6
\$5,000-\$9,999-----	60.2	-	22.4	38.0	215.7	36.1	29.5	64.5	55.8
\$10,000 or more-----	364.7	-	347.4	-	-	100.0	-	463.4	236.9
Tropia (manifest strabismus):									
Less than \$5,000-----	24.1	20.6	16.1	29.9	28.7	8.9	43.3	27.4	20.8
\$5,000-\$9,999-----	12.5	-	-	-	27.5	36.1	12.2	24.3	-
\$10,000 or more-----	133.5	-	-	-	-	510.7	-	236.6	-
Latent strabismus (confirmed):									
Less than \$5,000-----	29.6	-	38.7	79.6	20.8	21.1	19.3	35.6	23.7
\$5,000-\$9,999-----	22.6	-	22.4	18.7	67.9	-	17.3	5.8	40.6
\$10,000 or more-----	127.9	-	-	-	-	489.2	-	226.7	-

Table 22. Prevalence rates for past and present eye problems reported on medical history (from parent, youth, school) among youths age 12-17 years, by age and sex: United States, 1966-70

Age and sex	Defective acuity (parent answers)			Defective acuity (youth answers)					Other eye trouble ever		Ever had operation on eyes (parent answers)	Facility for visually handicapped (school answers)	
	Youth wears		Youth needs glasses	Wears		With own lenses		Does not wear but needs glasses	Parent answers	Youth answers		Needed	Used
	Glasses	Contacts		Glasses	Contacts	Sees as well as most	Needs change						
Both sexes	Rate per 100 youths						Percent of those with glasses		Rate per 100 youths				
12-17 years-----	33.0	1.2	6.4	33.9	1.4	93.3	21.0	11.6	6.8	6.4	1.4	0.2	0.1
12 years-----	27.4	0.2	4.5	29.4	0.3	91.9	20.2	9.3	6.6	5.3	1.9	0.2	0.2
13 years-----	30.0	0.4	5.9	31.2	0.2	94.6	20.9	11.7	8.1	7.8	1.5	0.1	0.1
14 years-----	31.7	0.8	6.3	31.7	0.6	92.2	20.6	12.4	6.2	6.3	1.3	0.3	0.2
15 years-----	35.3	0.8	8.1	36.6	1.3	92.0	21.5	12.9	6.2	6.8	1.2	0.4	0.2
16 years-----	35.8	2.7	7.0	36.1	2.8	93.4	22.4	11.0	5.9	6.0	1.2	0.1	-
17 years-----	38.7	2.5	7.1	39.4	3.4	95.5	20.6	12.6	8.0	6.1	1.2	0.2	0.1
Boys	Rate per 100 youths						Percent of those with glasses		Rate per 100 youths				
12-17 years-----	28.0	0.5	4.9	28.7	0.7	92.5	20.5	8.8	6.7	5.6	1.8	0.2	0.2
12 years-----	25.4	-	4.5	27.3	0.1	89.8	18.1	7.1	5.4	4.5	1.9	-	-
13 years-----	22.8	0.3	5.0	23.9	0.1	93.5	19.5	10.7	7.5	7.1	2.1	0.3	0.3
14 years-----	26.1	0.1	5.1	25.2	-	90.6	20.8	10.9	7.3	6.1	1.9	0.2	0.2
15 years-----	31.1	0.4	5.5	32.7	1.0	91.8	19.0	7.7	6.0	5.3	1.8	0.7	0.4
16 years-----	30.2	1.8	3.8	30.2	2.0	93.5	19.7	7.3	5.8	4.9	1.7	-	-
17 years-----	33.2	0.4	5.4	33.5	1.4	95.5	25.6	8.5	8.3	6.0	1.3	0.2	0.2
Girls	Rate per 100 youths						Percent of those with glasses		Rate per 100 youths				
12-17 years-----	38.1	1.9	8.2	39.2	2.0	93.9	21.4	15.0	7.0	7.1	1.0	0.2	0.1
12 years-----	29.4	0.5	4.6	31.5	0.5	93.7	22.0	11.7	7.8	6.0	1.8	0.5	0.5
13 years-----	37.4	0.4	7.0	38.6	0.2	95.3	21.7	13.0	8.6	8.5	0.8	-	-
14 years-----	37.4	1.5	7.7	38.2	1.2	93.3	20.4	14.3	5.0	6.6	0.7	0.3	0.1
15 years-----	39.5	1.3	11.3	40.6	1.6	92.2	23.6	19.1	6.4	8.3	0.7	-	-
16 years-----	41.5	3.6	11.1	42.2	3.6	93.4	24.4	15.7	6.0	7.2	0.6	0.2	-
17 years-----	44.2	4.5	9.3	45.3	5.3	95.4	17.0	18.0	7.7	6.2	1.2	0.2	-
Both sexes	Standard error												
12-17 years-----	1.02	0.14	0.45	1.00	0.13	0.59	1.14	0.70	0.51	0.44	0.13	0.05	0.04
12 years-----	1.37	0.06	0.45	1.59	0.09	1.98	2.91	0.90	0.87	0.61	0.47	0.17	0.17
13 years-----	1.62	0.12	0.88	1.74	0.10	1.39	2.18	1.34	1.08	1.11	0.41	0.09	0.09
14 years-----	1.78	0.29	0.92	1.71	0.26	1.83	2.35	1.33	0.80	0.82	0.32	0.17	0.11
15 years-----	1.93	0.31	1.02	1.91	0.43	1.10	1.88	0.90	0.72	0.60	0.37	0.08	0.14
16 years-----	1.76	0.38	1.12	1.50	0.40	1.08	2.20	1.72	1.03	1.00	0.29	0.09	-
17 years-----	1.79	0.67	1.01	1.69	0.66	1.15	2.04	1.30	0.79	0.87	0.35	0.12	0.07
Boys	Standard error												
12-17 years-----	0.82	0.10	0.32	0.80	0.14	0.91	1.04	0.70	0.52	0.62	0.20	0.04	0.05
12 years-----	1.81	-	0.78	1.70	0.14	3.18	2.87	0.73	0.73	0.73	0.65	-	-
13 years-----	2.05	0.21	0.88	2.11	0.12	2.09	2.97	1.36	1.13	1.28	0.74	0.18	0.18
14 years-----	2.24	0.12	0.95	2.12	-	2.13	3.01	1.69	1.26	1.11	0.58	0.17	0.17
15 years-----	1.91	0.24	1.06	2.05	0.55	2.14	2.66	1.29	1.06	0.81	0.51	0.17	0.29
16 years-----	2.05	0.48	1.23	1.80	0.52	1.44	2.69	1.51	1.21	1.10	0.52	-	-
17 years-----	1.84	0.24	1.23	2.07	0.46	1.59	3.68	1.41	0.91	1.31	0.65	0.15	0.15
Girls	Standard error												
12-17 years-----	1.54	0.27	0.73	1.49	0.27	0.57	1.54	0.98	0.60	0.45	0.18	0.09	0.06
12 years-----	2.07	0.12	0.64	2.40	0.12	1.85	4.18	1.77	1.45	1.02	0.68	0.34	0.34
13 years-----	2.71	0.12	1.64	2.63	0.17	1.28	3.08	2.32	1.22	1.37	0.36	-	-
14 years-----	2.85	0.58	1.31	2.87	0.53	2.07	2.93	1.85	1.11	1.43	0.34	0.20	0.15
15 years-----	2.10	0.57	1.50	3.15	0.71	2.11	3.50	1.86	1.05	1.01	0.41	-	-
16 years-----	2.87	0.69	2.13	2.39	0.80	1.58	3.15	2.58	1.31	1.42	0.33	0.18	-
17 years-----	2.66	1.28	1.81	2.35	1.35	1.52	2.05	2.49	1.18	1.22	0.51	0.19	-

Table 23. Percent of youths age 12-17 years wearing glasses all day or only for special use, by age and sex: United States, 1966-70

Age and sex	All youths who wear glasses	Wear glasses all day	Wear glasses for special use only	Wear glasses for special use only					
				Distance	Reading	TV	Distance	Reading	TV
<u>Both sexes</u>				Rate per 100 youths			Standard errors		
12-17 years---	35.4	18.3	17.1	13.9	20.1	1.6	2.4	3.4	0.3
12 years-----	29.8	15.3	14.5	9.2	27.3	1.0	1.3	4.0	0.1
13 years-----	31.5	17.6	13.9	9.4	22.1	1.5	1.3	3.1	0.2
14 years-----	32.9	18.0	14.9	12.4	16.4	1.0	1.8	2.4	0.1
15 years-----	37.9	18.0	19.9	16.4	18.9	2.1	3.3	3.8	0.4
16 years-----	38.9	20.4	18.5	15.0	18.4	2.3	2.8	3.4	0.4
17 years-----	43.0	21.1	21.9	18.4	18.4	1.3	4.0	4.0	0.3
<u>Boys</u>									
12-17 years---	29.6	16.6	13.0	17.9	21.7	2.3	2.3	2.8	0.3
12 years-----	27.5	14.2	13.3	14.1	30.0	2.1	1.9	4.0	0.3
13 years-----	24.3	14.6	9.7	9.4	24.4	-	0.9	2.4	-
14 years-----	25.6	14.3	11.3	16.9	21.9	1.4	1.9	2.5	0.2
15 years-----	33.7	18.4	15.3	22.4	20.2	4.3	3.4	3.1	0.7
16 years-----	32.1	19.7	12.4	17.9	12.9	2.9	2.2	1.6	0.4
17 years-----	35.3	18.9	16.4	23.3	20.6	2.0	3.8	3.4	0.3
<u>Girls</u>									
12-17 years---	41.5	20.1	21.4	11.4	19.0	1.2	2.4	4.1	0.3
12 years-----	32.3	16.4	15.9	4.9	25.0	-	0.8	4.0	-
13 years-----	39.1	20.8	18.3	9.4	20.9	2.3	1.7	3.8	0.4
14 years-----	40.3	21.8	18.5	9.6	12.9	0.8	1.8	2.4	0.1
15 years-----	42.3	17.7	24.6	12.4	18.1	0.7	3.1	4.5	0.2
16 years-----	45.8	21.0	24.8	13.5	21.2	2.0	3.3	5.3	0.5
17 years-----	51.0	23.4	27.6	15.6	17.1	0.9	4.3	4.7	0.2

Table 24. Percent of youths age 12-17 years by parent's and youth's statement on medical history regarding need for glasses: United States, 1966-70

Youth's statement of need for glasses, age, and sex ¹	Parent statement on youth's need for glasses ¹				Parent-youth agreement ¹	Parent-youth disagreement ¹		Other parent-youth disagreement			
	Total	Yes	No	Don't know		Parent-yes-youth-no	Parent-no-youth-yes	Parent-youth has glasses		Youth says he has glasses	
								Youth says he needs	Youth says he does not need	Parent says he needs	Parent says he does not need
	Percent of all youths without glasses							Percent of all youths			
Both sexes, 12-17 years-	100.0	5.5	79.8	14.7	79.2	1.6	4.2	5.3	1.7	15.8	1.9
Yes-----	11.2	3.8	4.2	3.2	---	---	---	---	---	---	---
No-----	88.1	1.6	75.2	11.3	---	---	---	---	---	---	---
Don't know-----	0.7	0.1	0.4	0.2	---	---	---	---	---	---	---
Boys, 12-17 years-----	100.0	4.2	82.4	13.4	80.9	1.8	3.8	4.5	2.0	15.1	1.6
Yes-----	8.6	2.4	3.8	2.4	---	---	---	---	---	---	---
No-----	90.9	1.8	78.3	10.8	---	---	---	---	---	---	---
Don't know-----	0.5	-	0.3	0.2	---	---	---	---	---	---	---
Girls, 12-17 years-----	100.0	7.1	76.6	16.3	76.9	1.6	4.7	6.0	1.4	16.4	2.4
Yes-----	14.4	5.4	4.7	4.3	---	---	---	---	---	---	---
No-----	84.7	1.6	71.3	11.8	---	---	---	---	---	---	---
Don't know-----	0.9	0.1	0.6	0.2	---	---	---	---	---	---	---

¹Excludes those youths who say or whose parents say the youths have glasses.

Table 25. Percent of youths age 12-17 years wearing glasses or contact lenses according to parent's and youth's medical history response among those with at least "normal" and those with defective uncorrected acuity by age and sex: United States, 1966-70

Age and sex	Parent-youth wears glasses or contact lenses				Youth-wears glasses or contact lenses			
	Uncorrected acuity				Uncorrected acuity			
	20/20 or better	20/40 or less	14/14 or better	14/28 or less	20/20 or better	20/40 or less	14/14 or better	14/28 or less
	Rate per 100 youths in acuity group							
Both sexes, 12-17 years-----	14.6	88.9	26.4	88.9	15.7	89.6	27.2	90.4
12 years-----	11.8	79.6	20.9	79.9	14.0	81.1	22.3	84.8
13 years-----	11.6	81.3	23.2	85.2	12.5	82.7	23.8	88.0
14 years-----	11.6	90.0	24.1	90.8	11.8	89.8	23.7	90.8
15 years-----	17.1	92.2	29.3	80.7	18.8	93.0	30.8	83.0
16 years-----	17.4	93.5	29.3	95.5	17.7	94.0	29.8	96.5
17 years-----	18.8	96.3	32.6	97.2	20.5	96.7	34.0	96.0
Boys, 12-17 years-----	10.8	88.0	21.4	89.2	11.9	89.0	22.2	90.5
Girls, 12-17 years-----	18.8	89.6	31.7	88.6	20.2	90.1	32.7	90.3
	Standard errors							
Both sexes-----	0.57	1.00	1.08	1.25	0.60	0.97	1.04	1.54
Boys-----	0.77	1.49	0.93	1.78	0.69	1.51	0.89	1.75
Girls-----	0.95	1.30	1.58	1.42	1.06	1.20	1.57	1.75

Table 26. Percent of youths age 12-17 years needing glasses according to parent's and youth's medical history response among those with at least "normal" and those with defective uncorrected acuity by age and sex: United States, 1966-70

Age and sex	Parent-youth needs glasses				Youth-needs glasses			
	Uncorrected acuity				Uncorrected acuity			
	20/20 or better	20/40 or less	14/14 or better	14/28 or less	20/20 or better	20/40 or less	14/14 or better	14/28 or less
	Rate per 100 youths in acuity group							
Both sexes, 12-17 years-----	4.7	32.4	5.3	47.3	8.7	52.9	10.0	68.6
12 years-----	2.7	27.8	3.2	42.3	6.3	44.7	7.4	54.8
13 years-----	3.9	27.2	5.3	27.2	7.9	58.1	10.5	72.2
14 years-----	5.3	24.6	5.4	56.0	9.8	59.3	10.5	85.9
15 years-----	5.9	42.0	6.4	58.0	10.1	55.8	11.1	60.1
16 years-----	5.7	35.7	6.3	59.6	8.6	29.7	10.0	56.4
17 years-----	5.4	79.8	5.8	49.3	10.3	84.7	11.2	100.0
Boys, 12-17 years-----	3.8	29.5	4.2	44.5	6.4	44.8	7.9	53.8
Girls, 12-17 years-----	6.0	34.9	6.7	49.1	11.7	59.7	12.7	78.9
	Standard errors							
Both sexes-----	0.41	4.94	0.38	5.68	0.64	2.36	0.68	7.56
Boys-----	0.31	6.16	0.29	9.42	0.64	4.93	0.63	11.17
Girls-----	0.74	5.93	0.71	9.43	1.08	3.26	1.11	8.44

Table 27. Prevalence rates for past and present eye problems reported on medical history (from parent, youth, school) among white and Negro youths age 12-17 years by age and sex: United States, 1966-70; with selected rates for white and Negro children age 6-11 years: United States, 1963-65

Medical history and race	Both sexes							Boys 12-17 years	Girls 12-17 years	12-17 years		
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years			Both sexes	Boys	Girls
Rate per 100 youths										Standard errors		
Defective acuity (parent)-youth												
Wears glasses:												
White-----	34.4	28.2	31.8	33.3	37.2	37.5	39.3	29.4	39.6	1.17	0.92	1.73
Negro-----	23.2	20.6	18.8	22.1	21.8	24.0	32.8	17.6	28.5	1.38	1.70	2.01
Wears contacts:												
White-----	1.3	0.2	0.3	0.9	0.9	2.9	2.7	0.5	2.1	0.18	0.12	0.31
Negro-----	0.3	-	0.7	0.5	-	0.7	-	0.2	0.4	0.24	0.25	0.27
Needs glasses:												
White-----	5.2	3.4	4.3	5.0	7.6	6.1	5.1	3.9	6.7	0.48	0.37	0.74
Negro-----	12.7	10.8	13.1	13.3	10.0	11.6	18.3	9.9	15.8	1.20	1.30	1.59
Defective acuity (youth)												
Wears glasses:												
White-----	35.2	29.8	33.0	33.6	38.1	37.7	40.0	30.0	40.6	1.15	0.88	1.67
Negro-----	24.9	25.5	19.8	19.7	25.4	25.9	34.1	19.3	30.4	1.85	1.87	2.62
Wears contacts:												
White-----	1.5	0.3	0.2	0.7	1.4	3.1	3.7	0.8	2.2	0.16	0.15	0.31
Negro-----	-	-	-	-	-	-	-	-	-	-	-	-
With own lenses-sees as well as most:												
White-----	93.7	92.8	94.4	92.5	92.8	93.1	96.1	92.7	94.4	0.58	0.97	0.54
Negro-----	90.2	84.4	96.2	89.7	86.9	96.2	89.2	89.5	90.6	1.57	2.74	2.42
Needs change:												
White-----	19.2	18.0	19.3	18.7	19.0	21.9	18.1	19.0	19.3	1.06	0.93	1.53
Negro-----	40.1	38.7	39.0	41.4	45.7	30.2	45.2	38.5	41.2	4.56	5.36	4.58
Does not wear but needs glasses:												
White-----	10.1	8.8	10.2	11.3	10.7	9.1	10.6	7.8	13.0	0.69	0.65	1.07
Negro-----	19.3	12.3	19.0	18.7	22.9	21.3	23.3	14.2	25.0	1.75	2.21	1.99
Other eye trouble ever												
Parent:												
White-----	6.0	6.0	7.6	5.2	5.5	5.8	6.1	6.0	6.1	0.51	0.51	0.60
Negro-----	11.8	10.4	11.5	11.8	10.6	7.2	19.9	11.1	12.5	1.50	2.03	1.49
Youth:												
White-----	6.0	4.8	6.6	6.1	6.6	6.3	5.8	5.3	6.8	0.44	0.61	0.48
Negro-----	8.5	8.4	14.4	7.5	8.7	4.3	7.0	7.2	9.7	1.49	1.65	1.81
Ever had operation on eyes:												
White-----	1.5	2.2	1.6	1.2	1.3	1.3	1.0	1.8	1.1	0.17	0.22	0.21
Negro-----	1.0	-	0.6	1.8	0.7	0.4	2.7	1.6	0.4	0.57	1.07	0.41
Facility for visually handicapped												
Needed:												
White-----	0.2	-	0.2	0.1	0.4	0.1	0.2	0.2	0.1	0.05	0.05	0.06
Negro-----	0.5	1.8	-	1.1	-	-	-	0.2	0.8	0.35	0.19	0.56
Used:												
White-----	0.1	-	0.2	0.1	0.2	-	0.1	0.2	0.0	0.04	0.07	0.02
Negro-----	0.4	1.8	-	0.6	-	-	-	0.2	0.6	0.28	0.19	0.44
Wears glasses all or part of day:												
White-----	36.8	30.0	33.3	34.7	39.7	40.7	44.0	30.9	43.0	1.25	0.97	1.88
Negro-----	25.7	26.6	20.9	22.5	25.2	25.7	34.1	19.6	31.7	1.53	1.89	2.24
Wears glasses all day:												
White-----	19.2	15.6	19.1	19.2	18.8	21.4	21.8	17.6	20.9	0.67	0.63	1.02
Negro-----	11.6	11.1	9.0	11.2	11.1	13.4	14.0	9.0	14.1	0.97	1.36	1.35
Wears glasses part of day:												
White-----	17.6	14.4	14.2	15.5	20.9	19.3	22.2	13.3	22.1	0.67	0.61	1.03
Negro-----	14.1	15.5	11.9	11.3	14.1	12.3	20.1	10.6	17.6	0.89	1.41	1.15
Medical history and race	Both sexes							Boys 6-11 years	Girls 6-11 years	6-11 years		
	6-11 years	6 years	7 years	8 years	9 years	10 years	11 years			Both sexes	Boys	Girls
Rate per 100 children										Standard errors		
Wears glasses:												
White-----	10.8	2.6	4.8	9.1	11.3	16.3	21.5	10.0	11.5	0.62	0.77	0.69
Negro-----	7.4	0.6	4.2	10.8	8.8	10.1	10.4	7.6	7.2	1.67	2.03	1.57
Ever had eye operation:												
White-----	1.3	1.0	2.0	1.5	1.2	0.9	1.4	1.5	1.2	0.19	0.23	0.23
Negro-----	1.1	-	1.4	0.3	0.8	2.9	1.4	1.7	0.5	0.28	0.45	0.40
Special facility for visually handicapped needed:												
White-----	1.4	1.1	1.0	1.7	0.9	2.2	1.3	1.4	1.3	0.13	0.18	0.22
Negro-----	1.9	-	1.3	2.4	1.2	2.7	3.9	1.8	2.0	0.64	0.73	0.76

Table 28. Prevalence rates for past and present eye problems reported on medical history (from parent, youth, school) by geographic region for youths age 12-17 years by age and sex: United States, 1966-70; with selected rates for children age 6-11 years by geographic region: United States, 1963-65

Medical history and geographic region	Both sexes							Boys 12-17 years	Girls 12-17 years	12-17 years		
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years			Both sexes	Boys	Girls
<u>Defective acuity (parent)-youth</u>	Rate per 100 youths							Standard errors				
<u>Wears glasses:</u>												
Northeast-----	36.5	25.6	30.0	38.3	40.5	44.7	43.6	31.0	42.2	2.40	2.14	3.05
Midwest-----	39.4	35.0	38.1	36.0	39.6	43.0	45.3	34.4	44.4	1.92	1.41	3.36
South-----	23.0	19.1	18.7	19.6	25.0	24.8	31.1	18.5	27.6	1.79	2.20	1.97
West-----	32.0	27.5	30.7	32.9	36.2	30.8	34.3	27.0	37.1	3.76	2.71	5.31
<u>Wears contacts:</u>												
Northeast-----	0.6	-	-	0.9	-	1.3	1.7	0.4	0.8	0.21	0.24	0.35
Midwest-----	1.3	0.6	-	0.2	1.2	3.1	2.8	0.6	2.0	0.29	0.18	0.58
South-----	1.5	-	0.8	0.4	1.0	3.2	3.6	0.5	2.5	0.43	0.08	0.80
West-----	1.3	0.3	0.7	1.8	0.9	2.8	1.6	0.4	2.2	0.20	0.27	0.34
<u>Needs glasses:</u>												
Northeast-----	5.3	5.1	3.6	2.8	7.9	7.3	6.3	3.4	7.6	0.48	0.60	0.90
Midwest-----	5.0	2.7	6.1	4.4	7.4	4.8	4.4	3.7	6.5	0.53	0.83	0.89
South-----	9.5	8.4	10.5	8.8	9.1	8.6	12.2	7.0	12.5	1.33	0.87	1.92
West-----	5.4	2.1	2.9	8.2	7.9	7.1	5.1	4.9	6.0	1.05	0.53	2.02
<u>Defective acuity (youth)</u>												
<u>Wears glasses:</u>												
Northeast-----	38.2	28.8	32.8	39.5	43.1	43.9	44.0	32.2	44.4	2.19	2.23	2.73
Midwest-----	39.6	36.2	37.6	35.0	41.2	41.8	46.9	35.0	44.4	2.19	1.47	3.76
South-----	24.0	22.6	20.0	21.0	25.9	26.1	28.7	19.0	29.2	1.76	1.72	2.06
West-----	32.8	28.1	32.2	31.0	36.4	33.0	36.9	27.6	38.2	3.74	3.03	4.79
<u>Wears contacts:</u>												
Northeast-----	0.8	-	-	0.7	-	2.0	2.4	0.6	1.0	0.25	0.17	0.46
Midwest-----	1.5	0.8	-	-	1.5	3.9	3.3	0.8	2.3	0.36	0.24	0.78
South-----	1.2	-	-	-	1.3	1.7	4.4	0.4	2.0	0.33	0.16	0.56
West-----	1.9	0.3	0.7	1.8	2.2	3.2	3.2	1.1	2.6	0.15	0.51	0.42
<u>With own lenses-sees as well as most:</u>												
Northeast-----	94.8	94.4	95.0	93.2	92.8	95.8	97.6	94.6	94.9	1.48	1.92	1.63
Midwest-----	93.4	88.9	96.5	93.6	92.9	94.6	93.7	92.6	94.0	0.97	1.21	1.03
South-----	91.8	93.7	93.2	85.6	89.8	92.6	94.9	87.3	94.7	1.54	1.95	1.42
West-----	92.9	92.7	92.5	93.8	91.8	90.1	96.4	93.7	92.3	0.83	2.45	0.69
<u>Needs change:</u>												
Northeast-----	19.4	20.3	20.6	16.4	19.5	21.6	18.6	16.8	21.4	1.84	1.37	2.56
Midwest-----	19.7	19.5	19.2	20.5	20.1	22.0	17.4	20.8	18.9	1.24	1.75	1.89
South-----	23.2	18.1	25.6	25.7	19.2	21.5	28.8	22.6	23.6	4.27	3.23	5.38
West-----	23.0	22.4	20.7	22.0	26.7	24.5	20.9	22.5	23.3	2.99	1.76	4.28
<u>Does not wear but needs glasses:</u>												
Northeast-----	7.9	3.2	5.5	6.9	9.6	13.3	13.0	6.1	10.2	1.49	1.33	2.32
Midwest-----	11.3	9.6	11.0	13.7	12.4	7.9	13.6	8.0	15.3	1.38	1.70	1.70
South-----	15.6	17.0	17.9	16.6	15.0	10.9	15.6	12.4	19.5	1.28	1.30	1.36
West-----	10.5	7.3	11.4	10.6	13.5	12.3	8.1	7.9	13.6	1.70	1.65	2.62
<u>Other eye trouble ever</u>												
<u>Parent:</u>												
Northeast-----	7.2	8.3	9.3	5.6	5.4	5.8	8.3	7.8	6.5	0.72	0.57	1.13
Midwest-----	5.7	5.0	7.2	4.4	6.0	6.0	5.4	4.9	6.4	1.43	1.12	1.95
South-----	7.7	6.9	10.2	6.4	7.8	5.1	10.1	7.5	7.9	0.86	1.05	0.81
West-----	7.0	6.6	6.2	8.4	5.7	6.6	8.7	7.0	7.0	1.44	1.66	1.54
<u>Youth:</u>												
Northeast-----	5.4	5.0	6.0	5.1	6.0	5.8	4.1	5.0	5.7	0.75	0.97	0.81
Midwest-----	7.1	5.3	7.3	6.4	8.4	7.4	7.8	6.1	8.0	0.78	1.01	0.82
South-----	7.2	5.8	8.3	8.7	8.7	4.8	7.0	6.5	8.0	0.70	1.13	0.70
West-----	5.7	5.1	9.5	5.0	3.8	5.7	4.9	4.8	6.5	1.20	1.82	1.25
<u>Ever had operation on eyes:</u>												
Northeast-----	1.5	2.4	0.9	1.8	1.4	1.5	1.1	1.4	1.6	0.39	0.28	0.56
Midwest-----	1.0	2.2	0.4	0.2	1.6	0.6	1.0	1.1	0.9	0.18	0.30	0.18
South-----	1.4	1.8	1.6	1.6	0.9	0.9	1.7	2.0	0.8	0.22	0.22	0.36
West-----	1.7	1.2	3.0	1.7	1.0	1.8	1.3	2.8	0.6	0.37	0.80	0.16
<u>Facility for visually handicapped</u>												
<u>Needed:</u>												
Northeast-----	0.5	1.0	-	1.0	0.4	-	0.4	0.3	0.6	0.20	0.10	0.36
Midwest-----	0.2	-	-	-	1.0	-	0.3	0.3	0.1	0.09	0.08	0.12
South-----	0.2	-	0.6	0.2	-	0.4	-	0.2	0.1	0.10	0.11	0.10
West-----	-	-	-	-	-	-	-	-	-	-	-	-
<u>Used:</u>												
Northeast-----	0.4	1.0	-	0.7	0.4	-	0.4	0.3	0.5	0.17	0.10	0.29
Midwest-----	0.1	-	-	-	0.5	-	-	0.1	-	0.07	0.15	-
South-----	0.1	-	0.6	0.2	-	-	-	0.2	-	0.06	0.11	-
West-----	-	-	-	-	-	-	-	-	-	-	-	-

Table 28. Prevalence rates for past and present eye problems reported on medical history (from parent, youth, school) by geographic region for youths age 12-17 years by age and sex: United States, 1966-70; with selected rates for children age 6-11 years by geographic region: United States, 1963-65—Con.

Medical history and geographic region	Both sexes							Boys 12-17 years	Girls 12-17 years	12-17 years		
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years			Both sexes	Boys	Girls
<u>Facility for visually handicapped—con.</u>	Rate per 100 youths									Standard errors		
Wears glasses all or part of day:												
Northeast-----	39.2	29.4	33.3	40.6	43.0	45.8	46.9	32.8	45.8	2.58	2.26	3.31
Midwest-----	41.3	37.0	37.4	36.3	42.7	45.7	50.3	35.8	47.0	2.01	1.47	3.56
South-----	25.4	22.6	20.0	21.4	27.6	27.9	33.2	19.6	31.4	1.98	2.33	2.24
West-----	35.0	28.4	33.6	33.3	38.6	36.1	40.9	29.2	41.0	4.11	2.93	5.87
Wears glasses all day:												
Northeast-----	17.0	11.8	16.6	18.9	17.1	18.5	20.3	16.0	18.0	2.63	1.37	2.59
Midwest-----	23.6	22.7	19.4	21.2	23.6	27.2	28.3	21.7	25.5	0.87	1.34	1.01
South-----	12.5	8.9	9.7	10.7	12.7	18.9	14.3	11.0	14.1	0.55	0.69	0.63
West-----	19.0	15.7	23.6	20.9	17.9	15.9	20.1	16.6	21.4	1.86	1.57	2.87
Wears glasses part of day:												
Northeast-----	22.2	17.6	16.7	21.7	25.9	27.3	26.6	16.8	27.8	1.91	1.45	2.57
Midwest-----	17.7	14.3	18.0	15.1	19.1	18.5	22.0	14.1	21.5	0.89	1.34	1.10
South-----	12.9	13.7	10.3	10.7	14.9	9.0	18.9	8.6	17.3	0.62	0.74	0.69
West-----	16.0	12.7	10.0	12.4	20.7	20.2	20.8	12.6	19.6	1.78	1.43	2.82
	Both sexes									6-11 years		
Medical history and geographic region	6-11 years	6 years	7 years	8 years	9 years	10 years	11 years	Boys 6-11 years	Girls 6-11 years	Both sexes	Boys	Girls
	Rate per 100 children									Standard errors		
Wears glasses:												
Northeast-----	12.6	3.2	7.6	10.2	14.8	16.1	26.1	12.1	13.1	1.12	1.76	0.96
Midwest-----	13.3	3.4	5.7	13.3	12.6	20.4	24.1	12.5	14.1	1.39	2.19	1.05
South-----	5.2	1.5	1.6	3.4	6.3	7.9	10.9	4.4	6.0	1.23	1.33	1.22
West-----	9.8	1.2	4.0	9.1	10.4	16.4	18.9	9.3	10.3	1.98	2.00	2.55
Ever had eye operation:												
Northeast-----	1.6	0.8	2.6	2.0	1.0	2.3	0.6	1.6	1.4	0.35	0.36	0.48
Midwest-----	1.4	0.4	1.9	0.9	2.0	1.6	1.2	1.6	1.1	0.27	0.25	0.38
South-----	0.9	0.7	1.6	0.8	0.9	0.3	1.1	1.2	0.6	0.26	0.40	0.39
West-----	1.3	1.5	1.5	1.5	0.5	0.5	2.6	1.6	1.1	0.36	0.55	0.34
Special facility for visually handicapped needed:												
Northeast-----	1.7	0.8	0.6	2.5	1.4	2.4	2.5	1.5	1.9	0.24	0.33	0.46
Midwest-----	1.1	0.3	1.1	2.0	0.8	1.6	0.6	1.2	1.1	0.40	0.49	0.34
South-----	2.2	1.8	1.4	2.5	0.4	3.9	3.1	2.4	1.9	0.30	0.30	0.46
West-----	1.0	1.4	0.8	0.2	1.0	1.5	0.8	1.1	0.8	0.18	0.32	0.35

Table 29. Prevalence rates for past and present eye problems reported on medical history (from parent, youth, school) by geographic region for white youths 12-17 years by age and sex: United States, 1966-70

Medical history and geographic region	Both sexes							Boys 12-17 years	Girls 12-17 years	12-17 years		
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years			Both sexes	Boys	Girls
<u>Defective acuity (parent)-youth</u>	Rate per 100 white youths								Standard errors			
Wears glasses:												
Northeast-----	36.7	24.9	30.6	38.6	40.8	44.6	43.7	31.6	42.1	2.54	2.47	3.09
Midwest-----	40.4	35.5	38.4	37.0	41.1	44.3	47.0	35.0	45.8	2.00	1.57	3.43
South-----	25.8	21.8	22.4	21.5	28.0	29.2	32.1	21.3	30.6	2.17	2.40	2.44
West-----	32.2	27.3	31.1	33.9	37.2	31.1	32.7	27.2	37.2	3.93	2.88	5.56
Wears contacts:												
Northeast-----	0.7	-	-	1.0	-	1.5	1.9	0.5	1.0	0.24	0.27	0.42
Midwest-----	1.2	0.3	-	-	1.0	3.0	3.1	0.5	1.8	0.31	0.16	0.58
South-----	1.8	-	0.5	0.6	1.4	3.9	4.7	0.5	3.3	0.66	0.22	1.16
West-----	1.4	0.3	0.8	2.0	1.0	3.0	1.5	0.5	2.3	0.24	0.31	0.34
Needs glasses:												
Northeast-----	4.3	3.4	3.7	2.0	7.5	6.5	3.7	3.0	6.0	0.80	0.69	1.24
Midwest-----	4.1	1.8	4.4	3.7	6.7	4.7	3.6	2.8	5.7	0.76	0.88	1.22
South-----	7.3	7.5	7.3	7.0	7.4	5.8	8.7	5.0	10.2	1.28	1.00	1.84
West-----	5.2	2.0	2.6	7.1	8.7	7.3	4.6	5.0	5.5	1.12	0.59	2.07
<u>Defective acuity (youth)</u>												
Wears glasses:												
Northeast-----	38.1	27.6	33.5	40.1	42.0	43.4	44.3	32.4	44.1	2.09	2.36	2.43
Midwest-----	40.4	35.5	37.9	36.5	42.8	43.0	47.8	35.2	45.6	2.31	1.51	3.91
South-----	27.4	25.7	24.0	24.4	29.2	30.6	30.4	22.4	32.7	2.30	2.25	2.52
West-----	32.8	28.0	32.8	31.8	37.0	32.8	35.0	27.6	38.1	3.81	3.06	5.02
Wears contacts:												
Northeast-----	0.9	-	-	0.8	-	2.3	2.8	0.6	1.2	0.29	0.19	0.53
Midwest-----	1.5	0.6	-	-	1.3	3.9	3.6	0.7	2.2	0.40	0.23	0.81
South-----	1.6	-	-	-	1.7	2.4	5.8	0.6	2.7	0.45	0.20	0.76
West-----	1.9	0.3	0.8	2.0	2.4	3.4	2.8	1.1	2.7	0.18	0.51	0.35
With own lenses-sees as well as most:												
Northeast-----	94.8	94.7	94.3	94.2	91.7	95.2	98.6	94.8	94.8	1.49	2.12	1.57
Midwest-----	93.5	89.7	96.2	93.2	93.2	94.2	94.0	92.4	94.3	1.01	1.19	1.09
South-----	92.9	98.6	94.4	84.9	90.6	93.8	95.2	88.7	95.8	1.32	2.07	1.22
West-----	93.3	91.9	92.2	94.0	94.5	89.3	97.7	93.6	93.1	0.94	2.82	0.87
Needs change:												
Northeast-----	16.8	13.4	20.1	14.7	15.9	18.9	17.3	15.4	17.9	1.34	1.20	2.03
Midwest-----	19.1	18.0	18.2	19.7	20.1	22.3	16.5	19.8	18.6	1.20	1.69	1.95
South-----	19.7	15.3	19.1	24.0	13.2	20.3	26.1	19.9	19.6	4.12	3.03	5.57
West-----	21.2	23.4	20.3	18.6	23.9	25.0	15.5	20.8	21.5	3.16	2.42	4.18
Does not wear but needs glasses:												
Northeast-----	6.9	2.7	4.7	6.2	9.2	12.0	10.6	5.4	8.9	1.65	1.33	2.94
Midwest-----	10.7	9.5	10.2	13.5	11.7	6.8	12.5	7.9	14.1	1.56	1.64	1.86
South-----	12.9	17.1	16.1	14.5	9.5	6.7	13.0	10.3	16.2	0.96	0.91	1.35
West-----	9.6	7.6	10.2	10.0	12.1	11.0	7.1	7.5	12.2	1.74	1.58	2.70
<u>Other eye trouble ever</u>												
Parent:												
Northeast-----	6.0	7.3	9.0	4.2	4.8	5.1	5.5	7.1	4.8	0.58	0.49	0.79
Midwest-----	5.5	4.4	7.1	4.2	5.7	6.4	5.2	5.2	5.8	1.26	1.22	1.55
South-----	6.6	6.3	9.4	5.5	7.4	4.5	6.3	6.2	6.9	0.96	1.29	0.86
West-----	6.3	6.4	5.9	7.1	4.4	6.6	7.3	5.8	6.7	1.28	0.98	1.77
Youth:												
Northeast-----	5.0	4.7	5.2	4.3	6.3	5.8	3.7	4.7	5.3	0.62	0.99	0.61
Midwest-----	6.7	4.5	6.2	6.4	8.5	7.5	7.5	5.8	7.6	0.57	0.77	0.75
South-----	7.4	5.6	7.5	9.6	8.5	5.6	7.1	7.1	7.6	0.83	1.23	0.83
West-----	5.1	4.6	7.8	4.8	3.1	5.8	4.6	4.0	6.4	0.97	1.39	1.14
Ever had operation on eyes:												
Northeast-----	1.6	2.7	1.0	1.7	1.6	1.7	0.7	1.4	1.8	0.45	0.29	0.67
Midwest-----	1.1	2.4	0.5	0.2	1.8	0.7	1.0	1.2	1.0	0.18	0.31	0.20
South-----	1.7	2.5	2.4	1.4	1.2	0.9	2.2	2.4	1.0	0.33	0.38	0.49
West-----	1.6	1.4	2.9	1.8	0.8	1.9	0.4	2.5	0.6	0.35	0.71	0.17

Table 30. Prevalence rates for past and present eye problems reported on medical history (from parent, youth, school) by geographic region for Negro youths age 12-17 years by age and sex: United States, 1966-70

Medical history and geographic region	Both sexes							Boys 12-17 years	Girls 12-17 years	12-17 years		
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years			Both sexes	Boys	Girls
	Rate per 100 Negro youths											
Defective acuity (parent)-youth												
Wears glasses:												
Northeast-----	36.2	29.7	26.2	37.1	40.2	47.0	43.2	26.8	43.0	4.53	3.49	5.90
Midwest-----	28.3	29.0	35.5	24.9	23.7	31.7	25.6	27.2	29.6	2.34	4.92	3.70
South-----	15.2	12.2	10.3	14.6	15.9	12.9	28.1	10.8	19.6	1.95	2.98	1.93
West-----	24.6	22.4	22.5	23.6	14.6	21.2	39.3	17.4	32.3	4.03	2.72	6.37
Wears contacts:												
Northeast-----	-	-	-	-	-	-	-	-	-	-	-	-
Midwest-----	0.5	-	-	3.0	-	-	-	-	1.1	0.59	-	1.38
South-----	0.5	-	1.3	-	-	1.4	-	0.5	0.4	0.50	0.54	0.46
West-----	-	-	-	-	-	-	-	-	-	-	-	-
Needs glasses:												
Northeast-----	12.0	16.9	2.8	8.6	11.5	14.2	22.9	6.9	16.9	3.29	3.98	5.48
Midwest-----	10.8	12.2	21.0	11.4	6.5	5.8	11.2	10.0	11.8	1.56	3.02	0.93
South-----	14.6	10.3	16.7	13.0	13.4	14.2	21.8	12.0	17.4	2.17	2.05	2.54
West-----	8.2	3.6	7.6	23.2	-	5.5	11.0	5.0	12.3	2.99	2.76	6.55
Defective acuity (youth)												
Wears glasses:												
Northeast-----	39.8	36.8	28.7	36.1	53.4	49.1	42.0	31.1	46.5	3.63	1.64	5.69
Midwest-----	31.5	42.2	34.7	18.9	25.8	31.7	36.3	31.2	31.8	2.33	6.41	3.97
South-----	14.7	14.5	11.2	11.7	15.9	13.8	23.4	9.3	20.2	1.43	1.62	2.54
West-----	29.0	22.4	22.5	25.2	20.0	31.5	49.5	22.4	36.7	6.59	7.04	8.06
Wears contacts:												
Northeast-----	-	-	-	-	-	-	-	-	-	-	-	-
Midwest-----	-	-	-	-	-	-	-	-	-	-	-	-
South-----	-	-	-	-	-	-	-	-	-	-	-	-
West-----	-	-	-	-	-	-	-	-	-	-	-	-
With own lenses-sees as well as most:												
Northeast-----	94.7	93.0	100.0	85.4	100.0	100.0	88.3	93.0	95.6	3.78	3.80	6.24
Midwest-----	91.0	78.8	100.0	100.0	85.4	100.0	89.4	93.7	88.0	3.17	5.91	3.57
South-----	85.7	71.4	87.6	89.4	85.2	85.4	93.6	77.8	89.4	3.57	6.28	4.16
West-----	87.7	100.0	100.0	90.0	47.0	100.0	84.5	92.8	84.5	4.51	6.14	8.66
Needs change:												
Northeast-----	38.0	53.3	23.9	30.2	43.0	41.3	31.0	29.2	42.7	8.31	10.28	8.42
Midwest-----	31.6	37.8	38.6	37.9	24.9	20.2	31.1	35.1	27.7	2.49	7.86	3.79
South-----	41.3	30.6	57.0	35.3	54.0	29.3	41.2	40.7	41.6	9.65	10.89	10.58
West-----	54.6	20.5	40.9	80.4	71.7	23.0	72.9	59.0	51.9	22.42	30.02	22.08
Does not wear but needs glasses:												
Northeast-----	15.0	7.6	10.0	12.6	15.0	26.1	26.8	11.7	18.3	3.75	4.25	4.49
Midwest-----	14.8	10.4	13.8	15.3	11.2	16.0	23.0	6.6	24.3	2.20	6.40	7.77
South-----	21.7	16.9	21.3	21.4	28.7	19.9	22.6	17.4	26.6	2.58	3.13	2.06
West-----	20.2	4.6	30.4	19.5	22.7	31.9	21.3	13.6	29.2	9.06	9.04	8.75
Other eye trouble ever												
Parent:												
Northeast-----	14.6	14.3	11.4	13.6	10.6	12.0	26.4	12.5	16.2	3.31	5.27	3.61
Midwest-----	7.0	11.6	9.8	6.2	4.1	2.8	8.3	2.2	12.6	4.38	2.34	7.25
South-----	10.9	8.5	12.0	8.8	8.9	6.8	21.8	11.1	10.6	1.81	2.10	2.12
West-----	16.8	9.0	11.1	28.2	27.3	8.7	18.3	20.9	12.5	3.62	12.98	6.97
Youth:												
Northeast-----	7.9	6.8	11.4	11.3	3.6	5.8	6.5	7.2	8.4	3.55	2.62	4.70
Midwest-----	10.5	14.2	18.0	6.2	7.5	6.8	12.0	8.0	13.4	3.19	4.83	2.00
South-----	6.9	6.0	10.1	6.2	9.2	2.6	6.8	4.8	9.0	1.96	2.22	2.67
West-----	12.4	11.2	37.3	8.2	15.7	4.4	3.0	14.3	10.2	3.30	5.07	4.36
Ever had operation on eyes:												
Northeast-----	1.1	-	-	2.9	-	-	3.9	1.1	1.0	0.62	1.11	1.48
Midwest-----	-	-	-	-	-	-	-	-	-	-	-	-
South-----	0.6	-	-	2.4	-	0.9	-	0.9	0.3	0.40	0.77	0.33
West-----	5.6	-	5.9	11.3	5.4	-	10.8	10.7	-	3.03	5.59	-

Table 31. Prevalence rates for past and present eye problems reported on medical history (from parent, youth, school) by annual family income for youths age 12-17 years by age and sex: United States, 1966-70; with selected rates for children age 6-11 years by annual family income: United States, 1963-65

Medical history and family income	Both sexes							Boys 12-17 years	Girls 12-17 years
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years		
<u>Defective acuity (parent)-youth</u>	Rate per 100 youths								
Wears glasses:									
Less than \$5,000-----	27.2	24.3	25.3	22.7	30.0	26.7	35.3	22.0	32.1
\$5,000-\$9,999-----	34.0	26.6	32.7	34.5	36.0	38.4	37.6	28.6	39.9
\$10,000 or more-----	36.9	31.8	33.3	34.5	40.2	39.3	43.0	33.4	40.4
Wears contacts:									
Less than \$5,000-----	0.3	-	0.3	0.8	-	0.4	-	0.1	0.4
\$5,000-\$9,999-----	0.6	-	-	0.5	0.6	1.5	1.4	0.2	1.1
\$10,000 or more-----	2.8	0.8	0.9	1.2	2.0	6.3	5.9	1.0	4.6
Needs glasses:									
Less than \$5,000-----	12.3	10.5	9.8	13.7	12.6	12.0	16.6	8.7	16.3
\$5,000-\$9,999-----	4.5	2.9	4.8	3.8	5.6	7.0	3.6	3.8	5.5
\$10,000 or more-----	2.5	1.1	2.6	2.2	5.3	2.5	1.7	1.8	3.4
<u>Defective acuity (youth)</u>									
Wears glasses:									
Less than \$5,000-----	28.4	26.0	25.2	23.8	31.2	26.8	38.5	22.6	33.8
\$5,000-\$9,999-----	35.1	28.8	33.8	34.9	37.9	38.1	38.4	30.2	40.4
\$10,000 or more-----	37.2	33.7	34.9	33.7	40.0	40.4	41.2	32.9	41.5
Wears contacts:									
Less than \$5,000-----	0.3	-	-	0.3	0.4	0.7	0.4	0.3	0.3
\$5,000-\$9,999-----	0.8	0.2	-	0.4	0.6	2.3	1.7	0.3	1.4
\$10,000 or more-----	3.1	0.8	0.6	1.2	3.2	5.4	7.4	1.6	4.5
With own lenses-sees as well as most:									
Less than \$5,000-----	89.9	89.9	98.2	80.7	83.6	95.7	92.7	89.0	90.5
\$5,000-\$9,999-----	93.3	90.9	91.9	95.7	94.5	91.2	96.6	92.0	94.4
\$10,000 or more-----	95.2	94.5	95.9	93.9	95.6	95.4	96.5	95.7	94.8
Needs change:									
Less than \$5,000-----	30.2	18.7	25.7	35.4	37.2	36.6	28.0	28.8	31.0
\$5,000-\$9,999-----	20.2	22.9	21.2	17.0	16.9	23.3	20.2	20.5	20.0
\$10,000 or more-----	15.6	18.2	16.8	15.7	14.2	14.7	14.8	14.1	16.7
Does not wear but needs glasses:									
Less than \$5,000-----	16.8	16.3	14.7	18.8	18.3	14.9	18.6	12.6	21.6
\$5,000-\$9,999-----	9.7	6.4	12.2	10.4	10.0	7.6	11.9	7.1	13.0
\$10,000 or more-----	8.5	7.0	8.9	9.4	10.6	8.6	6.7	7.2	10.1
<u>Other eye trouble ever</u>									
Parent:									
Less than \$5,000-----	9.0	9.8	9.4	6.2	8.4	8.6	12.0	8.6	9.5
\$5,000-\$9,999-----	5.9	5.4	6.5	6.2	6.0	4.4	6.8	5.8	6.0
\$10,000 or more-----	5.9	5.1	9.1	6.2	5.0	5.1	4.7	5.9	5.8
Youth:									
Less than \$5,000-----	7.3	7.3	9.4	8.1	7.7	6.0	5.0	6.2	8.5
\$5,000-\$9,999-----	6.0	4.7	7.4	6.2	6.2	4.8	6.5	5.4	6.5
\$10,000 or more-----	6.0	4.2	7.4	6.0	6.9	6.7	4.7	5.6	6.4
Ever had operation on eyes:									
Less than \$5,000-----	1.3	0.6	1.6	1.9	1.1	1.8	1.0	1.9	0.8
\$5,000-\$9,999-----	1.2	2.2	1.2	0.9	1.5	0.3	1.0	1.6	0.9
\$10,000 or more-----	1.8	2.8	1.8	1.1	1.2	1.5	2.0	2.0	1.5

Table 31. Prevalence rates for past and present eye problems reported on medical history (from parent, youth, school) by annual family income for youths age 12-17 years by age and sex: United States, 1966-70; with selected rates for children age 6-11 years by annual family income: United States, 1963-65—Con.

Medical history and family income	Both sexes							Boys 12-17 years	Girls 12-17 years
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years		
Rate per 100 youths									
Facility for visually handicapped									
Needed:									
Less than \$5,000-----	0.2	0.6	0.3	-	-	0.4	-	0.1	0.3
\$5,000-\$9,999-----	0.2	0.2	-	0.5	0.6	-	0.2	0.3	0.2
\$10,000 or more-----	0.2	-	0.2	-	0.5	-	0.3	0.2	0.1
Used:									
Less than \$5,000-----	0.2	0.6	0.3	-	-	-	-	0.1	0.2
\$5,000-\$9,999-----	0.2	0.2	-	0.5	0.6	-	0.2	0.3	0.2
\$10,000 or more-----	0.0	-	0.2	-	-	-	-	0.1	-
Wears glasses all or part of day:									
Less than \$5,000-----	28.6	26.6	25.8	24.7	31.6	27.3	39.1	23.1	34.5
\$5,000-\$9,999-----	36.1	29.0	34.0	35.5	38.8	40.5	40.7	30.6	42.0
\$10,000 or more-----	40.5	34.5	35.5	35.7	43.2	45.8	48.7	34.5	46.3
Wears glasses all day:									
Less than \$5,000-----	14.5	15.2	14.7	12.4	13.7	14.7	16.6	11.7	17.2
\$5,000-\$9,999-----	19.1	15.5	20.1	18.9	19.6	19.2	22.0	17.6	20.7
\$10,000 or more-----	21.3	15.8	18.4	21.6	21.5	25.0	25.7	19.6	22.9
Wears glasses part of day:									
Less than \$5,000-----	14.1	11.4	11.1	12.3	17.9	12.6	22.5	11.4	17.3
\$5,000-\$9,999-----	17.0	13.5	13.9	16.6	19.2	21.3	18.7	13.0	21.3
\$10,000 or more-----	19.2	18.7	17.1	14.1	21.7	20.8	23.0	14.9	23.4
Rate per 100 children									
Medical history and family income									
Medical history and family income	Both sexes							Boys 6-11 years	Girls 6-11 years
	6-11 years	6 years	7 years	8 years	9 years	10 years	11 years		
Wears glasses:									
Less than \$5,000-----	7.7	1.7	3.2	8.4	7.3	12.0	14.8	7.5	7.8
\$5,000-\$9,999-----	12.0	2.4	6.0	10.5	15.3	17.3	21.2	11.5	12.4
\$10,000 or more-----	12.4	3.4	6.7	7.7	10.6	17.7	27.3	10.6	14.4
Ever had eye operation:									
Less than \$5,000-----	1.1	1.2	1.0	0.4	1.4	1.2	1.7	1.5	0.8
\$5,000-\$9,999-----	1.3	0.8	2.1	1.7	0.9	1.4	0.8	1.5	1.1
\$10,000 or more-----	1.6	0.6	4.2	1.5	1.6	0.8	1.3	1.8	1.4
Special facility for visually handicapped needed:									
Less than \$5,000-----	1.9	0.8	1.5	2.1	0.6	3.6	2.5	2.0	1.7
\$5,000-\$9,999-----	1.2	1.3	0.9	1.6	1.5	1.3	0.5	1.4	1.0
\$10,000 or more-----	1.0	0.5	0.6	1.4	0.3	2.0	0.8	0.9	1.0

Table 32. Prevalence rates for past and present eye problems reported on medical history (from parent, youth, school) by annual family income for white youths age 12-17 years by age and sex: United States, 1966-70; with selected rates for white children age 6-11 years by annual family income: United States, 1963-65

Medical history and family income	Both sexes							Boys 12-17 years	Girls 12-17 years
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years		
<u>Defective acuity (parent)-youth</u>									
Rate per 100 white youths									
Wears glasses:									
Less than \$5,000-----	29.8	26.4	30.5	25.6	33.1	28.0	36.3	24.6	34.8
\$5,000-\$9,999-----	35.0	26.6	33.6	35.6	37.8	40.0	38.1	29.4	41.0
\$10,000 or more-----	36.9	32.1	33.3	34.4	40.5	39.4	42.4	33.3	40.5
Wears contacts:									
Less than \$5,000-----	0.1	-	-	0.8	-	-	-	-	0.3
\$5,000-\$9,999-----	0.7	-	-	0.6	0.7	1.7	1.6	0.3	1.2
\$10,000 or more-----	2.7	0.6	1.0	1.3	1.8	6.1	6.0	0.9	4.5
Needs glasses:									
Less than \$5,000-----	10.4	10.1	8.8	10.6	11.3	9.9	12.1	6.3	14.9
\$5,000-\$9,999-----	4.0	2.0	2.9	3.7	5.4	7.5	3.6	3.7	4.4
\$10,000 or more-----	2.4	0.8	2.1	2.3	5.5	2.6	1.7	1.5	3.5
<u>Defective acuity (youth)</u>									
Wears glasses:									
Less than \$5,000-----	31.0	26.7	30.7	28.1	32.7	28.9	40.3	25.5	36.2
\$5,000-\$9,999-----	35.9	28.7	34.5	36.2	39.8	39.0	38.8	30.9	41.4
\$10,000 or more-----	37.2	33.6	34.9	33.6	40.3	40.6	40.7	32.8	41.6
Wears contacts:									
Less than \$5,000-----	0.4	-	-	0.5	0.6	1.0	0.7	0.4	0.5
\$5,000-\$9,999-----	0.9	0.2	-	0.5	0.7	2.6	1.9	0.4	1.6
\$10,000 or more-----	3.0	0.6	0.6	1.3	3.0	5.3	7.3	1.5	4.4
With own lenses-sees as well as most:									
Less than \$5,000-----	90.0	92.6	98.2	78.8	83.1	95.8	93.6	89.2	90.6
\$5,000-\$9,999-----	93.3	91.0	92.0	96.2	94.2	90.5	96.9	91.9	94.6
\$10,000 or more-----	95.5	94.9	95.6	93.6	97.0	95.2	96.7	95.7	95.4
Needs change:									
Less than \$5,000-----	27.5	13.8	22.8	33.2	34.9	35.5	24.6	26.2	28.4
\$5,000-\$9,999-----	18.4	21.3	19.1	15.1	14.9	23.2	17.2	19.2	17.8
\$10,000 or more-----	14.9	17.6	16.5	15.5	12.4	14.7	13.8	13.4	16.1
Does not wear but need glasses:									
Less than \$5,000-----	15.0	19.6	12.2	17.3	13.6	11.1	15.6	10.4	19.9
\$5,000-\$9,999-----	9.0	5.6	11.2	10.1	9.1	7.8	11.1	7.3	11.3
\$10,000 or more-----	8.0	6.6	8.6	8.8	10.0	7.2	6.9	6.7	9.6
<u>Other eye trouble ever</u>									
Parent:									
Less than \$5,000-----	7.0	9.1	8.2	4.0	6.5	8.6	5.4	7.3	6.8
\$5,000-\$9,999-----	5.4	4.8	5.7	5.3	6.0	4.6	6.1	5.1	5.8
\$10,000 or more-----	5.9	5.3	9.3	6.2	4.6	5.0	5.0	5.9	5.9
Youth:									
Less than \$5,000-----	6.8	8.1	7.0	8.4	6.9	6.1	3.8	5.4	8.1
\$5,000-\$9,999-----	5.7	3.9	6.1	6.0	6.3	5.2	6.6	5.2	6.2
\$10,000 or more-----	5.8	3.8	7.5	5.7	6.7	6.6	4.5	5.4	6.3
Ever had operation on eyes:									
Less than \$5,000-----	1.7	0.9	2.4	2.4	1.6	2.3	0.8	2.6	0.9
\$5,000-\$9,999-----	1.2	2.4	1.1	0.8	1.7	0.4	0.4	1.4	1.0
\$10,000 or more-----	1.8	2.9	1.8	1.2	1.0	1.6	2.1	2.0	1.5

Medical history and family income	Both sexes							Boys 6-11 years	Girls 6-11 years
	6-11 years	6 years	7 years	8 years	9 years	10 years	11 years		
Rate per 100 white children									
Wears glasses:									
Less than \$5,000-----	8.1	2.1	2.8	7.4	7.6	13.7	16.6	7.8	8.4
\$5,000-\$9,999-----	12.0	2.6	5.9	10.5	15.0	17.3	22.4	11.7	12.4
\$10,000 or more-----	12.3	3.4	6.8	7.8	10.8	17.4	26.9	10.5	14.4
Ever have eye operation:									
Less than \$5,000-----	1.2	1.6	1.4	0.4	1.6	0.9	1.6	1.5	1.0
\$5,000-\$9,999-----	1.3	0.9	1.8	1.9	1.0	1.0	0.9	1.5	1.0
\$10,000 or more-----	1.6	0.6	4.2	1.5	1.6	0.8	1.3	1.8	1.5
Special facility for visually handicapped needed:									
Less than \$5,000-----	1.9	1.2	1.8	2.0	0.5	3.9	1.8	2.2	1.5
\$5,000-\$9,999-----	1.1	1.2	0.7	1.7	1.4	1.2	0.3	1.2	0.9
\$10,000 or more-----	1.0	0.5	0.6	1.5	0.3	2.0	0.8	0.9	1.0

Table 33. Prevalence rates for past and present eye problems reported on medical history (from parent, youth, school) by annual family income for Negro youths age 12-17 years by age and sex: United States, 1966-70; with selected rates for Negro children age 6-11 years by annual family income: United States, 1963-65

Medical history and family income	Both sexes							Boys 12-17 years	Girls 12-17 years
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years		
<u>Defective acuity (parent)-youth</u>									
Rate per 100 Negro youths									
Wears glasses:									
Less than \$5,000-----	21.0	19.0	15.4	16.5	22.0	23.8	32.2	16.0	26.0
\$5,000-\$9,999-----	24.3	25.8	23.8	25.5	20.7	22.1	30.0	18.3	30.5
\$10,000 or more-----	33.9	15.6	33.3	42.3	21.0	38.2	51.8	31.8	35.4
Wears contacts:									
Less than \$5,000-----	0.5	-	1.0	0.8	-	1.2	-	0.4	0.6
\$5,000-\$9,999-----	-	-	-	-	-	-	-	-	-
\$10,000 or more-----	-	-	-	-	-	-	-	-	-
Needs glasses:									
Less than \$5,000-----	16.1	11.4	11.6	19.4	15.8	16.4	26.6	13.4	19.3
\$5,000-\$9,999-----	7.5	10.9	16.6	4.7	2.8	4.1	4.3	3.6	12.2
\$10,000 or more-----	5.0	10.1	34.8	-	-	-	-	11.3	-
<u>Defective acuity (youth)</u>									
Wears glasses:									
Less than \$5,000-----	22.2	23.7	14.5	14.4	27.3	22.0	33.7	16.0	28.3
\$5,000-\$9,999-----	27.1	29.5	27.6	23.5	22.2	29.2	32.1	22.7	31.9
\$10,000 or more-----	36.6	30.6	33.3	42.3	21.0	38.2	51.8	35.1	37.7
Wears contacts:									
Less than \$5,000-----	-	-	-	-	-	-	-	-	-
\$5,000-\$9,999-----	-	-	-	-	-	-	-	-	-
\$10,000 or more-----	-	-	-	-	-	-	-	-	-
With own lenses-sees as well as most:									
Less than \$5,000-----	89.6	82.1	100.0	92.7	84.8	97.0	91.0	88.5	90.5
\$5,000-\$9,999-----	92.9	89.3	91.7	95.6	100.0	100.0	90.4	93.5	94.0
\$10,000 or more-----	86.7	84.9	100.0	100.0	57.8	100.0	80.6	94.4	85.1
Needs change:									
Less than \$5,000-----	39.6	32.0	38.9	44.8	46.6	40.1	38.0	40.1	39.4
\$5,000-\$9,999-----	45.0	37.3	47.8	46.3	52.4	28.2	64.5	41.1	47.9
\$10,000 or more-----	39.8	52.6	43.4	23.2	50.0	19.3	56.9	37.6	41.7
Does not wear but needs glasses:									
Less than \$5,000-----	20.3	9.6	19.0	21.6	27.1	22.7	24.5	16.7	24.4
\$5,000-\$9,999-----	13.6	13.0	17.0	14.5	12.7	6.9	19.9	4.0	25.4
\$10,000 or more-----	25.3	19.2	34.8	35.0	25.5	50.6	-	29.0	22.6
<u>Other eye trouble ever</u>									
Parent:									
Less than \$5,000-----	13.3	11.7	11.7	10.9	13.5	8.7	24.5	10.9	15.7
\$5,000-\$9,999-----	9.8	11.0	14.1	14.4	2.4	3.2	15.2	12.6	6.9
\$10,000 or more-----	5.9	-	-	8.3	20.2	7.9	-	6.9	5.1
Youth:									
Less than \$5,000-----	8.3	5.8	14.3	7.4	9.9	5.7	5.8	7.4	9.3
\$5,000-\$9,999-----	8.4	11.2	16.5	8.1	5.3	1.9	5.9	7.3	9.6
\$10,000 or more-----	11.7	16.6	-	15.6	16.8	7.6	8.6	13.0	10.7
Ever had operation on eyes:									
Less than \$5,000-----	0.5	-	-	1.0	-	0.8	1.4	0.4	0.7
\$5,000-\$9,999-----	1.8	-	2.3	2.3	-	-	8.2	3.6	-
\$10,000 or more-----	1.6	-	-	-	9.6	-	-	3.7	-
Medical history and family income	Both sexes							Boys 6-11 years	Girls 6-11 years
	6-11 years	6 years	7 years	8 years	9 years	10 years	11 years		
Rate per 100 Negro children									
Wears glasses:									
Less than \$5,000-----	6.5	0.8	4.2	10.9	6.5	7.4	10.2	6.9	6.0
\$5,000-\$9,999-----	10.0	-	5.4	11.0	17.3	15.9	8.9	9.8	10.2
\$10,000 or more-----	13.4	-	-	-	-	51.1	-	23.7	-
Ever had eye operation:									
Less than \$5,000-----	0.9	-	-	0.4	1.1	2.1	2.1	1.6	0.1
\$5,000-\$9,999-----	2.0	-	5.6	-	-	6.9	-	2.1	2.0
\$10,000 or more-----	-	-	-	-	-	-	-	-	-
Special facility for visually handicapped needed:									
Less than \$5,000-----	1.8	-	0.7	2.4	0.9	2.6	4.7	1.5	2.2
\$5,000-\$9,999-----	1.5	-	3.1	-	2.4	3.8	-	2.2	0.8
\$10,000 or more-----	-	-	-	-	-	-	-	-	-

Table 34. Prevalence rates of tropia and other eye muscle problems at ages 12-17 years and 6-11 years among youths included in both surveys with population estimates for youths represented: United States, 1966-70

Target population and selected findings from both examinations	Age at time of second examination								
	Both sexes							Boys 12-17 years	Girls 12-17 years
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years		
U.S. noninstitutionalized population in 1968									
Total (1,000's)-----	22,692	4,003	3,952	3,851	3,750	3,625	3,511	11,490	11,202
Target population for those in both surveys (1,000's)-----	6,975	1,975	2,034	1,949	972	45	-	3,482	3,493
Percent in both:									
Total-----	30.7	49.3	51.5	50.6	25.9	1.2	-	30.3	31.2
Boys-----	30.3	48.7	51.3	48.9	25.5	1.4	-	-	-
Girls-----	31.2	50.0	51.6	52.4	26.4	1.1	-	-	-
Tropia findings									
Rate per 100 in both examinations									
Total as youths 12-17 years-----	3.7	3.7	3.5	4.0	3.6	-	-	4.0	3.5
Total as children 6-11 years-----	2.8	2.8	3.0	2.1	3.6	-	-	2.8	2.8
As both child and youth-----	1.1	1.5	0.9	1.0	0.9	-	-	1.3	0.9
As youth but not child-----	2.6	2.2	2.6	3.0	2.7	-	-	2.7	2.6
As child but not youth-----	1.7	1.3	2.1	1.1	2.7	-	-	1.5	1.9
Other eye muscle problems									
Total as youths 12-17 years-----	1.7	0.9	0.2	1.9	2.3	6.7	-	1.6	1.9
Total as children 6-11 years-----	4.5	5.2	4.9	4.8	2.0	13.2	-	3.8	5.4
As both child and youth-----	0.2	0.3	0.4	-	-	6.7	-	0.1	0.4
As youth but not child-----	1.5	0.6	1.6	1.9	2.3	-	-	1.5	1.5
As child but not youth-----	4.3	4.9	4.5	4.8	2.0	6.5	-	3.7	5.0

Table 35. Prevalence rates for wearing of glasses, history of eye operations, or history of other eye trouble at ages 12-17 years and 6-11 years among youths included in both surveys: United States, 1966-70

Medical history item as reported by parent	Age at time of second examination								
	Both sexes							Boys 12-17 years	Girls 12-17 years
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years		
<u>Wore glasses or contact lenses</u>	Rate per 100 in both examinations								
Total as youths-----	31.6	27.5	32.4	35.8	30.3	9.9	-	27.9	35.2
Total as children-----	15.9	10.5	16.1	21.0	16.3	9.9	-	14.3	17.4
As both child and youth-----	13.7	8.4	14.5	19.2	11.5	9.9	-	12.6	14.7
As youth only-----	17.9	19.1	17.9	16.6	18.8	-	-	15.3	20.5
As child only-----	2.2	2.1	1.6	1.8	4.8	-	-	1.7	2.7
<u>Ever have eye operation</u>									
Total as youths-----	1.4	1.7	1.2	1.4	1.0	5.4	-	1.8	1.0
Total as children-----	1.2	1.3	1.0	1.3	1.3	-	-	1.5	0.9
As both child and youth-----	1.0	1.1	0.9	1.1	1.0	-	-	1.1	0.9
As youth only-----	0.4	0.6	0.3	0.3	-	5.4	-	0.7	0.1
As child only-----	0.2	0.2	0.1	0.2	0.3	-	-	0.4	-
<u>Ever have eye trouble other than need for glasses</u>									
Total as youths-----	6.7	5.2	8.7	5.4	8.7	-	-	6.0	7.4
Total as children-----	16.7	12.4	18.0	17.0	22.6	5.3	-	14.4	18.9
As both child and youth-----	3.0	1.8	4.1	2.1	5.4	-	-	2.7	3.3
As youth only-----	3.7	3.4	4.6	3.3	3.3	-	-	3.3	4.1
As child only-----	13.7	10.6	13.9	14.9	17.2	5.3	-	11.7	15.6

APPENDIX I

STATISTICAL NOTES

The Survey Design

The sample design for the first three programs or Cycles I-III of the Health Examination Survey has been essentially similar in that each has been a multistage, stratified probability sample of clusters of households in land-based segments. The successive elements for this sample design are primary sampling units, census enumeration district, segment (a cluster of households), eligible persons, and finally the sample person.

The same 40 sample areas and the same segments were utilized in the design of both Cycles II and III. Previous reports describe in detail the sample design used for Cycle II and in addition discuss the problems and considerations given to other types of sampling frames, cluster versus random sampling, and whether or not to control the selection of siblings.^{4,5}

Requirements and limitations placed on the design for both Cycles II and III were that:

1. The target population be defined as the civilian noninstitutional population of the United States, including Alaska and Hawaii, between the ages of 6 and 11 years for Cycle II and between 12 and 17 years for Cycle III, with the special exclusion of children residing on reservation lands of the American Indians. The latter exclusion was due to operational problems encountered on these lands in Cycle I.
2. The time period of data collection be limited to about 3 years for each cycle and the length of the individual examination within the specially constructed mobile examination center be between 2 and 3 hours.
3. Ancillary data be collected on specially designed household, medical history, and school questionnaires and from birth certificate copies.
4. Examination objectives be primarily related to factors of physical and intellectual growth and development.
5. The sample be sufficiently large to yield reliable findings within broad geographic regions and population density groups as well as age, sex, and limited socioeconomic groups for the total sample.

The sample was drawn jointly with the Bureau of the Census starting with the 1960 decennial census list of addresses and the nearly 1,900 primary sampling units (PSU's) into which the entire United States was divided. Each PSU is either a standard metropolitan statistical area (SMSA), a county, or a group of two or three contiguous counties. These PSU's were grouped into 40 strata, so that each stratum having an average size of about 4.5 million persons, in such a manner as to maximize the degree of homogeneity within strata with regard to the population size of the PSU's, degree of urbanization, geographic proximity, and degree of industrialization. The 40 strata were then classified into four broad geographic regions of 10 strata each and then within each region, cross-classified by four population density classes and classes of rate of population change from 1950 to 1960. Using a modified Goodman-Kish controlled-selection technique, one PSU was drawn from each of the 40 strata.

Further stages of sampling within PSU's required first the selection of census enumeration districts (ED's). The ED's are small well-defined areas of about 250 housing units into which the entire Nation was divided for the 1960 population census. Each ED was assigned a "measure of size" equal to the rounded whole number resulting from a "division by nine" of the number of children, aged 5-9, in the ED at the time of the 1960 census. A sample of 20 ED's in the sample PSU were selected by systematic sampling with each ED having a probability of selection proportional to the population of children 5-9 years at the time of the 1960 census date. A further random selection by size of segments (smaller clusters of housing units) within each ED was then made.

Because of the 3-year time interval between Cycle II and Cycle III, the Cycle III frame had to be supplemented for new construction and to compensate for segments where housing was partially or totally demolished to make room for highway construction or urban redevelopment.

Advanced planning for the examinations at the various locations or stands provided for about 17 days of examinations which limited the number of examinees per location to approximately 200. When the number of eligible persons (children or youth) in the sample drawn

for a particular location exceeded this number, subsampling was done by deleting from the master list of eligible persons (ordered by segment, household order within segment, and age within household) every n^{th} name on the list starting with the y^{th} name, y being a number between 1 and n selected randomly and n being the extent of oversampling in the original draw.

In both Cycle II and III twins who were deleted in the sample selection, were also scheduled for examination, time permitting, as were youth deleted from the Cycle III sample who had been examined in Cycle II.

The sample was selected in both Cycles II and III so as to contain the correct proportion of children from families having only one eligible child, two eligible children, and so on to be representative of the total target population. However, since households were one of the elements in the sample frame, the number of related children or youth, in the resultant sample is greater than would come from a design which sampled children 6-11 or 12-17 years without regard to household. The resultant estimated mean measurements or rates should be unbiased but their sampling variability will be somewhat greater than those from more costly, time-consuming systematic sample design in which, every k^{th} child would be selected.

The total probability sample for Cycle II contained 7,417 children representative of the approximately 24 million United States children 6-11 years of age in the target population at the time of the Survey while that for Cycle III included 7,514 youths similarly representative of the approximately 22.7 million noninstitutionalized U.S. youths of 12-17 years. Each of these two samples contained children (or youth) from 25 different States and approximately 1,000 in each single year of age.

The response rates in Cycles II and III were 96 and 90 percent, respectively, with 7,119 children and 6,768 youth examined out of the total sample. Both groups of examinees were closely representative of their respective samples as well as the population from which the samples were drawn with respect to age, sex, race, region, population density, and population growth in area of residence. Hence it appears unlikely that non-response could bias the findings appreciably.

Measures used to control the quality of the data from these surveys have been cited previously^{12,13}; those additional measures specifically related to the particular examinations, tests, or measurements are outlined in the analytic reports describing and presenting the respective initial findings.

Reliability

While measurement processes in the surveys were carefully standardized and closely controlled; the correspondence between the real world and Survey results cannot be expected to be exact. Survey data are imperfect for three major reasons: (1) results are sub-

ject to sampling error, (2) the actual conduct of a survey never agrees perfectly with the design, and (3) the measurement processes themselves are inexact even though standardized and controlled.

The first reports on Cycles II⁴ and III⁵ describe in detail the faithfulness with which the sampling design was carried out.

Data recorded for each sample child and youth are inflated in the estimation process to characterize the larger universe of which the sample child or youth is representative. The weights used in this inflation process are a product of the reciprocal of the probability of selecting the child or youth, an adjustment for non-response cases, and a poststratified ratio adjustment which increases precision by bringing survey results into closer alignment with known U.S. population figures by color and sex within single years of age 6 through 11 for the children's survey and age 12 through 17 for the youth's survey.

In the second and third cycles of the Health Examination Survey the samples were the result of three principal stages of selection—the single PSU from each stratum, the 20 segments from each sample PSU, and the sample children and youth from the eligible persons. The probability of selecting an individual child or youth is the product of the probability of selection at each stage.

Since the strata are roughly equal in population size and a nearly equal number of sample children or youth were examined in each of the sample PSU's, the sample design is essentially self-weighting with respect to the target population; that is, each child 6-11 years old and youth 12 through 17 years had about the same probability of being drawn into the respective samples.

The adjustment upward for nonresponse is intended to minimize the impact of nonresponse on final estimates by imputing to nonrespondents the characteristics of "similar" respondents. Here "similar" respondents were judged to be examined children or youth in a sample PSU having the same age (in years) and sex as children or youth not examined in that sample PSU.

The poststratified ratio adjustment used in the second and third cycles achieved most of the gains in precision which would have been attained if the sample had been drawn from a population stratified by age, color, and sex and made the final sample estimates of population agree exactly with independent controls prepared by the Bureau of the Census for the noninstitutional population of the United States as of August 1, 1964 (approximate midsurvey point for Cycle II) by color and sex for each single year of age 6-11; and similarly as of March 9, 1968 (approximate midsurvey point for Cycle III) for each single year of age 12-17. The weight of every responding sample child and for each sample youth in each of the 24 age, color, and sex classes is adjusted upward or downward so that the weighted total within the class equals the independent population control for each survey.

In addition to children or youth not examined at all, there were some whose examination was incomplete in one procedure or another.

Sampling and Measurement Error

In the present report, reference has been made to efforts to minimize bias and variability of measurement techniques.

The probability design of the survey makes possible the calculation of sampling errors. The sampling error is used here to determine how imprecise the survey test results may be because they come from a sample rather than from the measurements of all elements in the universe.

The estimation of sampling errors for a study of the type of the Health Examination Survey is difficult for at least three reasons: (1) measurement error and "pure" sampling error are confounded in the data—it is not easy to find a procedure which will either completely include both or treat one or the other separately, (2) the survey design and estimation procedure are complex and accordingly require computationally involved techniques for the calculation of variances, and (3) from the survey are coming thousands of statistics, many for subclasses of the population for which there are a small number of cases. Estimates of sampling error are obtained from the sample data and are themselves subject to sampling error which may be large when the number of cases in a cell is small or even occasionally when the number of cases is substantial.

Estimates of approximate sampling variability for

selected statistics used in this report are included in the detailed tables. These estimates have been prepared by a replication technique which yields overall variability through observation of variability among random subsamples of the total sample. The method reflects both "pure" sampling variance and a part of the measurement variance.

In accordance with usual practice, the interval estimate for any statistic may be considered the range within one standard error of the tabulated statistic with 68-percent confidence; or the range within two standard errors of the tabulated statistic with 95-percent confidence. The latter is used as the level of significance in this report.

An approximation of the standard error of a difference $d=x-y$ of two statistics x and y is given by the formula $S_d = (S_x^2 + S_y^2)^{1/2}$ where S_x and S_y are the sampling errors, respectively of x and y . Of course, where the two groups or measures are positively or negatively correlated, this will give an overestimate or underestimate, respectively, of the actual standard error.

Small Numbers

In some tables magnitudes are shown for cells for which the sample size is so small that the sampling error may be several times as great as the statistic itself. Obviously in such instances the statistic has no meaning in itself except to indicate that the true quantity is small. Such numbers, if shown, have been included in the belief that they may help to convey an impression of the overall story of the table.



APPENDIX II

DEMOGRAPHIC AND SOCIOECONOMIC TERMS

Age.—The age recorded for each youth was the age at last birthday on the date of examination. The age criterion for inclusion in the sample used in this survey was defined in terms of age at time of interview. Since the examination usually took place 2 to 4 weeks after the interview, some of those who were 17 years old at the time of interview became 18 years old by the time of examination. There were 23 such cases. In the adjustment and weighting procedures used to produce national estimates, these 23 were included in the 17 year group.

Race.—Race was recorded as "white," "Negro," or "Other races." The last category included American Indians, Chinese, Japanese, and all races other than white or Negro. Mexican persons were included with "white" unless definitely known to be American Indian or of another race. Negroes and persons of mixed Negro and other parentage were recorded as "Negro."

Geographic region.—For purposes of stratification the United States was divided into four geographic regions of approximately equal population. These regions, which correspond closely to those used by the U.S. Bureau of the Census, were as follows:

<i>Region</i>	<i>States Included</i>
Northeast -----	Maine, Vermont, New Hampshire, Massachusetts, Connecticut,

<i>Region</i>	<i>States Included</i>
Northeast-Con.--	Rhode Island, New York, New Jersey, and Pennsylvania.
Midwest -----	Ohio, Illinois, Indiana, Michigan, Wisconsin, Minnesota, Iowa, and Missouri.
South -----	Delaware, Maryland, District of Columbia, West Virginia, Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Arkansas.
West -----	Washington, Oregon, California, Nevada, New Mexico, Arizona, Texas, Oklahoma, Kansas, Nebraska, North Dakota, South Dakota, Idaho, Utah, Colorado, Montana, Wyoming, Alaska, and Hawaii.

Family Income.—The income recorded was the total income received during the past 12 months by the head of the household and all other household members related to the head by blood, marriage, or adoption. This income was the gross cash income (excluding pay in kind) except for families with their own farms or businesses, in which cases net income was recorded.



APPENDIX III

RECORDING FORMS

Physical Examination—Youth

HEALTH EXAMINATION SURVEY—III PHYSICAL EXAMINATION - YOUTH

EYES: A, LIDS, CONJUNCTIVAE AND SCLERAE					B. PUPILS AND IRIDES				
R					L				
1 <input type="checkbox"/>					1 <input type="checkbox"/>	NO FINDINGS			
2 <input type="checkbox"/>					2 <input type="checkbox"/>	FINDINGS →			
Describe: _____					Describe: _____				
_____					_____				
_____					_____				
C. TROPIA (<i>indicate direction</i>)					D. EXTRAOCULAR MUSCLES AND CONJUGATE GAZE				
NORMAL IN OUT UP DOWN					R L				
R 1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	1 <input type="checkbox"/> NORMAL			
L 1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	2 <input type="checkbox"/>	2 <input type="checkbox"/> ABNORMAL →			
Describe: _____					Describe: _____				
_____					_____				
_____					_____				
E. OTHER EYE ABNORMALITIES					1 <input type="checkbox"/> NO 2 <input type="checkbox"/> YES (<i>Describe</i>) _____				
_____					_____				
_____					_____				

Physical Examination—Child

HEALTH EXAMINATION SURVEY—II
PHYSICAL EXAMINATION — CHILDREN

CARD 04-1

EYES

(11) 1 No findings 2 Findings

FINDINGS

(12) 1 Stye (13) 1 Conjunctivitis (14) 1 Blepharitis

(15) 1 Strabismus (indicate type—location and tests positive)

(16) Manifest—R: 1 IN 2 OUT 3 UP 4 DOWN

(17) L: 1 IN 2 OUT 3 UP 4 DOWN

(18) Latent— R: 1 IN 2 OUT 3 UP 4 DOWN

(19) L: 1 IN 2 OUT 3 UP 4 DOWN

FINDINGS ON: (20) 1 Observation (21) 1 Moving light

(22) 1 Hirschberg test (23) 1 Screen test

(24) 1 Other (Specify)

PHYS.
EXAM.
+ B.P.

1

Medical History of Youth

PHS 4733-4 (Page 1)
REV. 3/66

FORM APPROVED
BUDGET BUREAU NO. 68-R1700

CONFIDENTIAL – All information which would permit identification of the individual will be held strictly confidential, will be used only by persons engaged in and for the purposes of the survey and will not be disclosed or released to others for any other purposes (22 FR 1687).

DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
NATIONAL HEALTH SURVEY

MEDICAL HISTORY OF YOUTH
Parent's Questionnaire

Sample number

NAME OF CHILD (*Last, First, Middle*)

SEGMENT

SERIAL

COL. NO.

NOTE: Please answer the questions by checking the correct boxes or by filling in the blanks, as required. If a question is unclear leave the answer blank and draw a line around the question. A representative of the Public Health Service will collect your filled in questionnaire in a few days and she will help you answer the unclear questions. Thank you for your cooperation.

22. Does he or she wear glasses or contact lenses?

1 Yes, glasses

3 Yes, contact lenses

2 No, don't wear either

IF NO: Do you think he or she needs glasses?

1 Yes

2 No

3 Don't know

23. Has he or she ever had eye trouble (except what is corrected by glasses or contact lenses)?

1 Yes

2 No

IF YES: What was it? _____

24. Has he or she ever had an eye operation?

1 Yes

2 No

IF YES: What was it for? _____

Health Habits and History—Youth

PHS-4733-6 (PAGE 1)
12-65

FORM APPROVED
BUDGET BUREAU NO. 68-R620-S4

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DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
NATIONAL HEALTH SURVEY

HES

Sample No.

HEALTH HABITS AND HISTORY — Youth

Name (Last, First, Middle)	SEGMENT	SERIAL	COL. NO.
-------------------------------	---------	--------	----------

INSTRUCTIONS: On the following pages you will find a set of questions dealing with your health. Since every person is different, there are no "standard" answers to the questions; just answer them as fully and honestly as you can. Your answers will be kept confidential. Do your best to pick the most likely answer from among the choices given. Only if you really don't know the answer check "Don't know."

HERE ARE A FEW QUESTIONS ABOUT YOUR EYES AND EARS.

12. Do you ever wear glasses or contact lenses?

1 Yes, glasses

3 No

2 Yes, contact lenses

IF YES:

IF NO:

a. With your glasses
(or contact lenses)
can you see as well
as most people?

aa. Do you think you
need glasses?

1 Yes 2 No

1 Yes 2 No

b. Do you think you need new glasses?

1 Yes 2 No

c. When do you wear them?

1 Not all day 2 All day

d. IF NOT ALL DAY: When? *(Check all that apply)*

1 For seeing at a distance

2 For reading

3 For TV

4 Other (*Specify*) _____

13. Is there anything wrong with your eyes (*except what is corrected by your glasses or contact lenses*)?

1 Yes 2 No

a. IF YES: What? _____

Child's Medical History

CONFIDENTIAL - The National Health Survey is authorized by Public Law 652 of the 84th Congress (70 Stat. 489; 42 U.S.C. 242c). All information which would permit identification of the individual will be held strictly confidential, will be used only by persons engaged in and for the purposes of the survey and will not be disclosed or released to others for any other purposes (22 FR 1687).

FORM APPROVED
BUDGET BUREAU NO. 68-R620-54.6

DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
NATIONAL HEALTH SURVEY

HES-256

(1-5)

CHILD'S MEDICAL HISTORY - Parent

NAME OF CHILD (Last, First, Middle)

(6-11)

SEGMENT

SERIAL

COL. NO.

NOTE: Please complete this form by checking the correct boxes and/or filling in the blanks where applicable.

When you have completed it, keep it until the representative of the Health Examination Survey calls on you within a few days. If there are some questions you do not understand, please complete the others and the person who comes for the form will help you with the ones that were unclear.

41. HERE ARE SOME QUESTIONS ABOUT YOUR CHILD'S EYES.

A. Has he/she ever had crossed eyes?

(19) 1 Yes 2 No 3 Don't know

B. Has he/she ever had an operation on his/her eyes?

(20) 1 Yes 2 No 3 Don't know

IF YES, what was it for? _____

C. Has he/she ever had other trouble with his/her eyes?

1 Yes 2 No 3 Don't know

IF YES, what kind of trouble? _____

D. Does he/she wear either glasses or contact lenses?

1 Yes 2 No 3 Don't know

42. IF HE(SHE) DOES NOT WEAR GLASSES:

A. Does he/she ever have trouble reading or doing fine work?

(23) 1 Yes 2 No 3 Don't know

B. Do his/her eyes or eyelids ever swell up or get red?

1 Yes 2 No 3 Don't know

C. Does he/she ever have styes, infections, or 'matter' in his/her eyes?

1 Yes 2 No 3 Don't know

D. Do his/her eyes often water?

1 Yes 2 No 3 Don't know

E. Are his(her) eyes often bloodshot?

1 Yes 2 No 3 Don't know

F. Does he(she) ever say that his(her) eyes burn or itch?

1 Yes 2 No 3 Don't know

G. Does bright light bother his(her) eyes?

(29) 1 Yes 2 No 3 Don't know

H. Does he(she) ever see double or see things blurred?

(30) 1 Yes 2 No 3 Don't know

I. Have you seen him(her) often rub his(her) eyes or blink when he(she) is reading?

1 Yes 2 No 3 Don't know

J. Does he(she) sometimes close or cover one eye or hold his head on one side when he(she) reads or watches T.V.?

1 Yes 2 No 3 Don't know

Supplemental Information from School

The student whose name appears below is one of the sample of students being studied in the Health Examination Survey. This student's parent or guardian has given us written authorization to obtain information from the school. Please complete this form on the basis of school records and/or information the student's teacher or other school official may have. A pre-addressed envelope, requiring no postage, is furnished for your convenience in returning this form.

SPECIAL RESOURCE	RESOURCE NEEDED <i>(Check one)</i>			REASON FOR NON-USE <i>(Check primary reason)</i>			
	BEING USED	NOT AVAILABLE	AVAILABLE BUT NOT USED	OVER-CROWDED	STUDENT OBJECTS	PARENTS OBJECT	OTHER <i>(Specify)</i>
g. Special facilities for the visually handi-capped							

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