

Hearing Sensitivity and Related Medical Findings Among Youths 12–17 Years United States

The prevalence of ear, nose, and throat abnormalities and the relation of these as well as events in the medical history to hearing sensitivity of youths 12-17 years, by age, sex, race, geographic region, size of place of residence, family income, and education of parent.

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COOPERATION OF THE BUREAU OF THE CENSUS

In accordance with specifications established by the National Health Survey, 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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HEARING SENSITIVITY AND RELATED MEDICAL FINDINGS AMONG YOUTHS 12-17 YEARS

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INTRODUCTION

This report contains estimates of the prevalence of ear, nose, and throat abnormalities among noninstitutionalized youths 12-17 years in the United States, based on findings from the Health Examination Survey of 1966-70. Included also is an analysis of the relationship of these conditions to the present status of hearing sensitivity and events in the youths' medical histories given by the youths and the parents. Findings by age, sex, race, geographic region, size of place of residence, family income, and education of parent are included.

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 activity for the determination of the health status of the population.¹

The principal health survey programs of the National Center for Health Statistics include the Health Examination, Health Interview, Health Manpower and Facilities, and Health Resources Utilization Surveys. The Health Interview Survey, which collects health information from samples of people by household interview, focuses primarily on the impact of known illness and disability on the lives of people. The Health Manpower and Facilities program collects information through surveys of inpatient and outpatient health facilities and the entire range of personnel in the health occupations. The Health Resources Utilization surveys obtain data on the

extent of health facility and service utilization. The Health Examination Survey, from which the data in this report are derived, collects data through direct physical examinations, tests, and measurements performed on scientifically selected nationwide probability samples of the population. This program, in addition to providing the most efficient way of obtaining actual diagnostic data on the prevalence of medically defined illnesses, is the only program of the Center that secures information on unrecognized or undiagnosed conditions and on a variety of physical, physiological, and psychological measures needed to assess deviations from normal in disease and other conditions within the population. In conjunction with the direct physical examination, medical history, demographic and socioeconomic data are also collected on the sample population.

The Health Examination Survey is carried out as a series of separate programs called "cycles." Each cycle is limited to certain aspects of health within segments of the U.S. population. The first cycle, conducted in 1960-62, was designed primarily to provide data on the prevalence of certain chronic diseases and on the distribution of various physical and physiological measures in a defined adult population.^{2,3}

The target population for the second cycle, conducted in 1963-65, was the noninstitutionalized children 6-11 years of age in the United States. This cycle focused primarily on health factors related to growth and development.^{4,5}

The third cycle, on which findings in this report are based, was similar in design to the

preceding children's program. In it data were obtained on the health status of the youth population, with particular concentration on factors and conditions related to their growth and development. For this program a probability sample of the noninstitutionalized youths 12-17 years in the United States was selected and examined. The questionnaires and examination content and procedures were similar to those used in the children's program, thus providing comparable information for the entire continuum of childhood through adolescence. In addition, supplemental data specially related to adolescent health were collected. Included were standardized examinations given by the survey pediatrician assisted by a nurse and those given by the survey dentist. Tests by a psychologist and a variety of tests and measures by laboratory X-ray technicians were also administered. The survey plan, sample design, examination content, and operation of this survey program have been described in a previous report.⁶

Field collection operations for the youths' cycle were begun in March 1966 and were completed in March 1970. Of the 7,514 youths selected in the national probability sample, 6,768 (90 percent) were examined. This national sample is representative and the examined group is closely representative of the 22.7 million civilian noninstitutionalized youths 12-17 years in the United States with respect to age, sex, race, 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 survey among children, members of the Subcommittee on Hearing in Children of the Committee on Conservation of Hearing of the American Academy of Ophthalmology and Otolaryngology—Dr. Raymond E. Jordan, Chairman; Dr. Eldon L. Eagles, Executive Director; and others—were advisors to the Health Examination Survey in the related ear, nose, and throat (ENT) portions of the examination. Dr. Leo Doerfler from the University of Pittsburgh was responsible for training the technicians in the testing of hearing, and Mr. Kenneth Stewart, also from the University of Pittsburgh, was responsible for the instrument calibration and environmental control aspects.

An earlier publication from the audiometric testing part of the survey examination included findings on hearing sensitivity of youths by age,

sex, and demographic and socioeconomic characteristics.⁷

Statistical notes on the survey design, reliability of the data, and sampling and measurement errors are shown in appendix I. Definitions of the demographic and socioeconomic factors included in this report are contained in appendix II.

DATA SOURCES

Medical Histories

At the time of the initial visit to the sample household, a U.S. Bureau of the Census interviewer left a self-administered Medical History of Youth form for each eligible youth to be completed by the parent. Seven of the questions on the form were directly related to hearing or conditions of the ear (appendix III). About one week later, the completed history was picked up by the Health Examination Survey representative who reviewed it and assisted the parent in answering incomplete or inconsistent items. At that time the interviewer left a Health Habits and History form for the youth to complete and return prior to his scheduled arrival for the examination. This form contained four questions directly related to hearing or conditions of the ear (appendix III).

The Medical History of Youth and the Health Habits and History forms were reviewed by the survey pediatrician on the day prior to the scheduled examination. He paid special attention to any entries suggesting a limitation in the youth's ability to perform any of the tests or procedures and to items which might require further followup in the course of the examination.

Ear, Nose, and Throat Examination

Each youth was given a comprehensive examination of the ear, nose, and throat (ENT) during the physical examination. The examining physicians were either senior residents or fellows in pediatrics from selected medical centers, medical schools, or hospitals and were generally employed only for a single sample area. In his review on the day prior to the examination of the youth's medical history given by his parent

and the health history which the youth had completed, the physician made sure that he was aware of any specific reported disturbance of the ear, nose, and throat that the examinee may have or have had.

For the ENT examination, the pediatrician used a Welch-Allyn pneumatic otoscope in addition to a Siegle's otoscope and head light. The examination included an inspection of the external ears, auditory canals, tympanic membranes, anterior nasal cavity, and oral pharynx, as indicated in appendix III.

Inspection of the external ears focused on congenital or acquired defects and the presence of scars, adenopathy, or fistulae of the pinna.

The external auditory canals were examined for polyps, exostoses, foreign bodies, and inflammation; the tympanic membranes, for mobility, dullness, abnormal transparency, opacity, scars, perforations, and exudates. No attempt was made to remove the cerumen or cellular debris when the youth's ears were partially or completely blocked. Where this occurred, the physician indicated which canal was occluded and identified the material or the reason for the blockage.

Mobility of the tympanic membrane or drum was tested with the pneumatic otoscope.

The nose was examined by speculum and the findings, including the presence of turbinate hypertrophy, polyps, septal deviation, foreign bodies, or obstruction by swollen tissue or exudate, were recorded. No attempt was made in this or other parts of the ENT examination to delineate whether tissue swelling or exudates were due to an allergic reaction or another cause. The subtle clinical judgment necessary for the recognition of the former was not possible in the survey because of time limitations and the brief specialized training that could be provided the medical examiners.

The oral pharynx was inspected for the presence of cleft palate (repaired or unrepaired), hypertrophic lymphoid tissue on the posterior pharyngeal wall, and postnasal mucopurulent discharge. An evaluation of the adenoid tissue in the nasopharynx and of the eustachian tubes was omitted because of the time and additional expertise required to perform these more difficult evaluations.

The presence or absence of tonsils was recorded, and if present they were graded accord-

ing to size as follows: Grade I—tonsils present within tonsillar pillars; Grade II—present, with tissue extending beyond the boundaries of the tonsillar pillars but not meeting in the midline; Grade III—tonsils greatly enlarged and meeting in the midline.

To insure skillful examinations by the staff physician and standardization of observations among the many different physicians employed during the course of the survey, two specific training methods were employed. Prior to reporting to the field, each examining physician, under the supervision of an otolaryngologist, received training in the specific examination of the ear, nose, and throat used in this survey. These training sessions included a review of the regional anatomy, refinement of the individual physician's examining skills, and training in the technique of pneumatic otoscopy. In addition, during the first several days of examinations at a location where a new staff physician was in attendance, senior medical advisors of the Health Examination Survey were present to review examination procedures, to perform replicate examinations, and to reduce to a minimum interobserver variation in grading and reporting.

Hearing Tests

As in the preceding survey among children, hearing threshold levels for each youth were determined monaurally and individually by trained technicians in an acoustically treated room within a specially constructed trailer in the mobile examining center. The standard pure-tone air-conduction audiometers used for testing at eight frequencies—250, 500, 1000, 2000, 3000, 4000, 6000, and 8000 Hertz (Hz—cycles per second)—were modified by the insertion of a 30-decibel (dB) attenuator. This was done to allow testing to as low as 40 decibels (dB) below audiometric zero (American Standard Association (ASA), 1951) in a stable part of the range of the instrument.⁷⁻⁹ During the latter part of the survey, as the older audiometers became more difficult to maintain in calibration, they were replaced with new standard audiometers calibrated to, and in accordance with, the American National Standards Institute (ANSI), 1969, specifications which incorporated the standards set in 1964 by the International

Organization for Standardization (ISO).^{10,11} The audiometers used for 82 percent of the hearing tests among youths were calibrated and maintained in accordance with the ASA-1951 specifications; the remaining 18 percent of the instruments used were calibrated and maintained in accordance with the ANSI-1969 specifications.

Testing was done by technicians specially trained in the use of a modified Hughson-Westlake method in which the tone was first presented at 60-dB intensity, decreased by 10-dB steps until no response was obtained, then increased 5 dB and dropped 10 dB until the lowest intensity was reached (threshold) at which responses were obtained in two out of three or three out of five ascending trials.

Performance of the room in attenuating external noise was determined by acoustical surveys conducted periodically under normal test conditions throughout the cycle. These survey findings and further analysis of the test data show no real evidence of masking from external noise throughout the test range. Quality of the test results were further controlled by daily and weekly field checks and approximate monthly calibration of the audiometers in the Acoustics Laboratory of the University of Pittsburgh.

For analytic purposes the two sets of measurements—the 82 percent from the ASA-1951 instruments and the 18 percent from the ANSI-1969 (ISO-1964) instruments—were converted to each standard for each examinee using the appropriate values shown in appendix IV. The hearing level findings for all youths in this report are shown in terms of ANSI-1969 values or units. Hearing levels for the subgroup of individuals who were examined in both Cycles II and III are given in ASA-1951 units. The effect of these conversions have been described in a previous report.⁷

FINDINGS

Medical History—Parent

Included in the self-administered medical history completed by the parent for each examined youth were seven questions directly related to functional hearing and events which might pro-

duce or be indicative of abnormal conditions of the ears. These were events considered possibly predictive of eventual hearing impairment.

Trouble hearing.—In response to the question “Does he or she have any difficulty hearing?,” nearly 1 youth in 28 (3.7 percent, or an estimated 0.8 million youths age 12-17 years) was considered by his or her parent to have such a problem (table 1). This is substantially higher than the 1.3 percent of youths identified as having a hearing handicap on the basis of air-conduction audiometric test results—those with hearing thresholds of 26 dB or more above “normal” (ANSI-1969 audiometric zero) in the 500-2000-Hz range generally considered most essential for speech.⁷ No age-related pattern of increasing or decreasing prevalence of this problem, as reported by parents, was evident.

Boys and girls, without regard to age, were equally likely to be reported by their parents as having trouble hearing. However, the prevalence rates were slightly higher among boys than girls at ages 12, 13, and 17 years, while at ages 14-16 years, girls were more likely to have this problem (figure 1). None of these differences were large enough to be considered statistically significant. It should be kept in mind that the parent's answer to this question may reflect the attentiveness of the youth in addition to any real hearing impairment.

Trouble hearing was significantly more frequently reported for Negro than for white youths—4.7 and 3.5 percent, respectively (table 2 and figure 2). This is consistent with the previously reported findings that hearing sensitivity among white youths was significantly better than among Negro youths in this country.⁷ The higher prevalence of trouble hearing for Negro than for white youths was found among both boys and girls and at ages 12-16 years. The slight reversal in this pattern evident at age 17 that is not consistent with hearing test results may be a reflection of sampling variability or the difference in the two types of measurements or estimates.

Youths in the South were more frequently reported by their parents as having trouble hearing than those in the other three regions of the country (table 3 and figure 3). The prevalence rate was significantly higher in the South (5.6 percent) than in the Northeast (2.4 per-

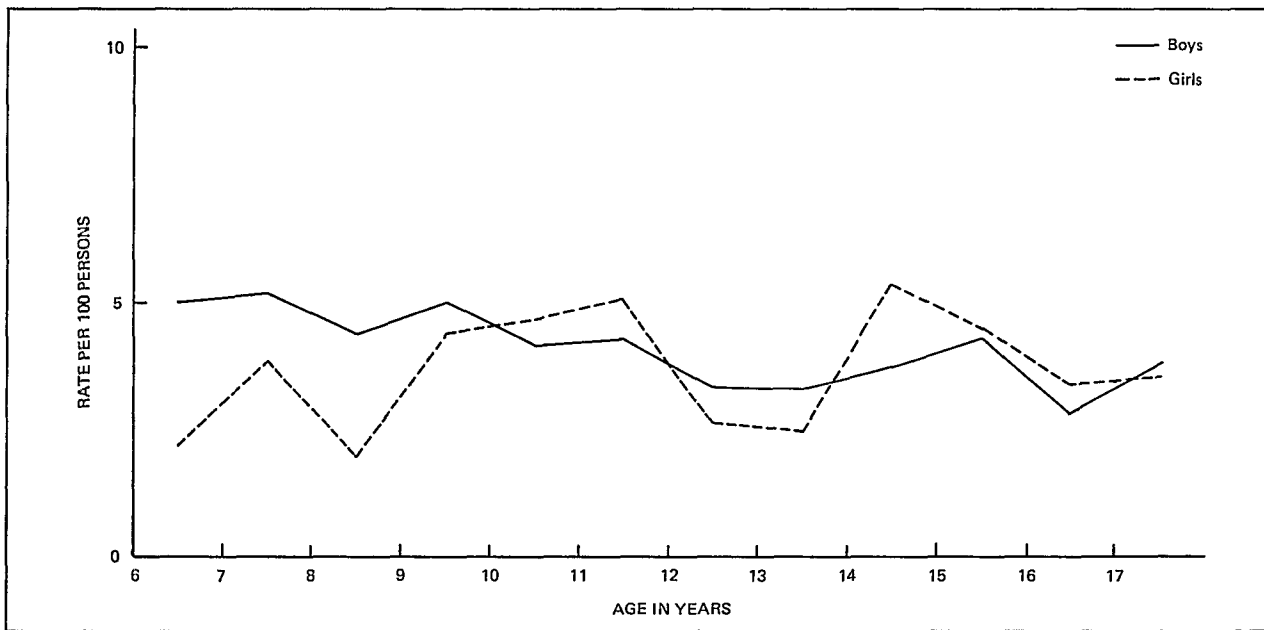


Figure 1. Prevalence rates of parent-reported history of trouble hearing among boys and girls 6-11 years (1963-65) and 12-17 years (1966-70), by age: United States.

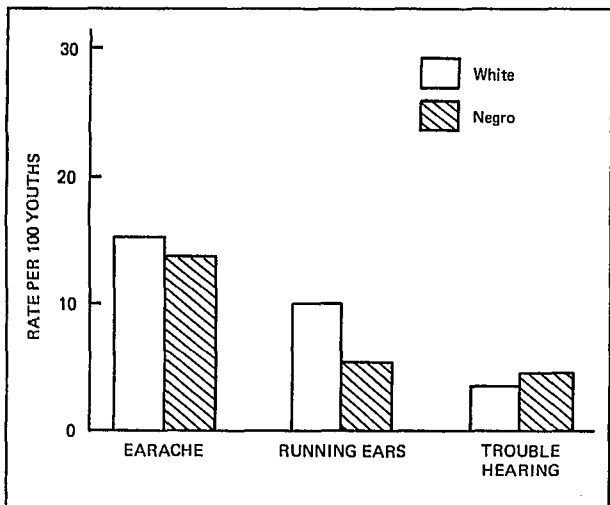


Figure 2. Prevalence rates of parent-reported history of earache, running ears, and trouble hearing among white and Negro youths 12-17 years: United States, 1966-70.

cent), the Midwest (3.2 percent), and the West (3.5 percent). This regional pattern is present among both boys and girls and within four of the six age groups—12, 13, 15, and 17 years. This is generally consistent with findings from the actual audiometric test results for U.S. youths.⁷ The minor exceptions to this regional

pattern at 14 and 16 years in the reported history of hearing trouble are not present in the audiometric findings and again probably reflect either sampling variability or inherent differences in the two types of measurements.

According to their parents, youths in rural areas were more likely to have trouble hearing than those in urban communities. The differences in the rates, however, were not large enough to be statistically significant and were found only among girls. This slightly higher rate among rural youths was also present only among the youngest and oldest ages—12, 13, 16, and 17 years (table 4).

The prevalence of trouble hearing was highest among youths in families with annual incomes of less than \$3,000. This rate (6.7 percent) was significantly greater than that for youths in each higher income group. The prevalence of this condition generally declined with increase in annual family income. The lowest rate (1.4 percent) was among youths in families with annual incomes of \$15,000 or more, a value significantly lower than that for those in income groups below \$10,000 (table 5). This negative association of trouble hearing with income is consistent with that for the actual hearing thresholds obtained by air-conduction audio-

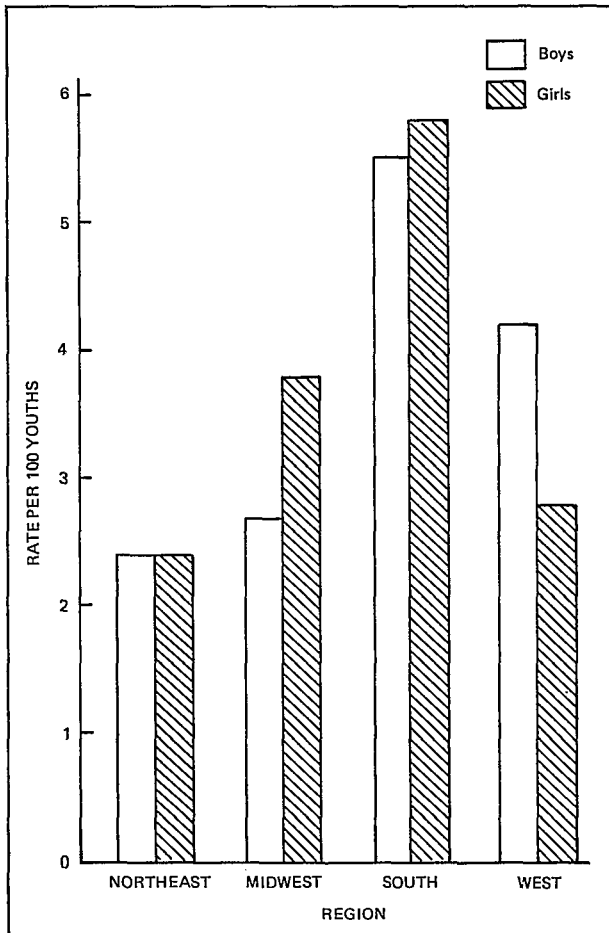


Figure 3. Prevalence rates of parent-reported history of trouble hearing among youths 12-17 years, by region: United States, 1966-70.

metric testing.⁷ In each region, trouble hearing was less prevalent among youths in families with annual incomes of \$10,000 or more than among those in families with lower annual incomes (figure 4).

A similar association to that shown above with income was found between reported trouble hearing and education of the parent (usually the father), as expected with the strong association existing between those socioeconomic variables ($r = +0.57$). Trouble hearing tended to be more prevalent among youths whose parents had the least education (table 6). The rate decreased from 7.2 percent among those whose parents had less than 5 years of formal education to 2.9 percent among those whose parents had 12 years or more. This

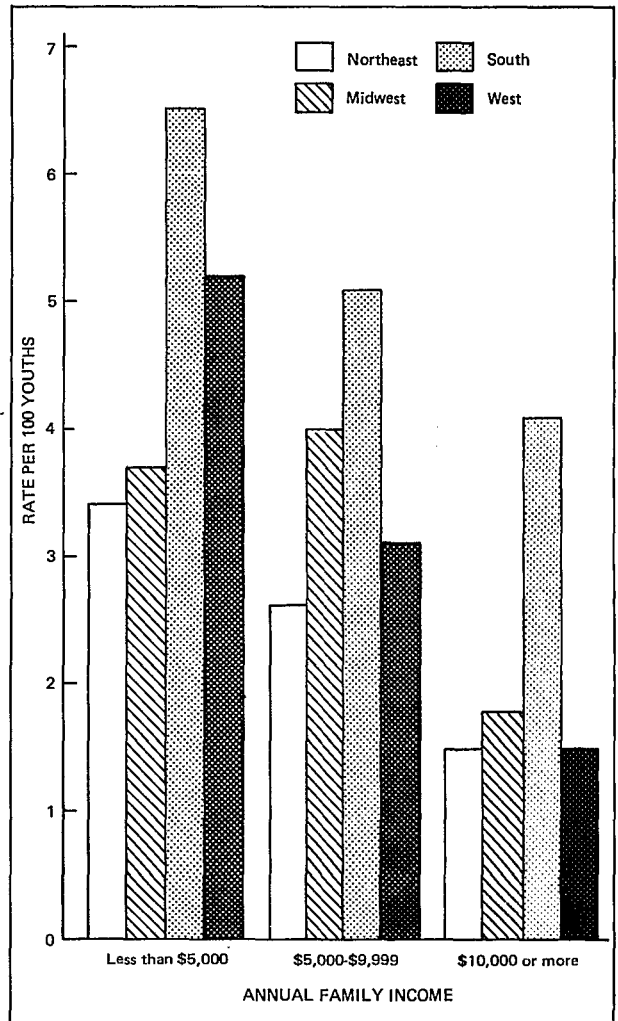


Figure 4. Prevalence rates of parent-reported history of trouble hearing among youths 12-17 years, by region and annual family income: United States, 1966-70.

finding is consistent with those from the audiometric test results.⁷ The pattern was generally consistent across age and sex, but the differences were not always large enough to be considered statistically significant.

The prevalence of trouble hearing as reported by the parents among U.S. youths 12-17 years (3.7 percent) in the present study is only slightly lower than that among U.S. children 6-11 years (4.2 percent) from the 1963-65 survey.¹² In general, the patterns of relationship of the prevalence of this condition to the various demographic and socioeconomic variables is similar among children and youths.¹³

Earaches.—To the question “In the past year has he or she had an earache?,” more than 1 youth in 7 (15.1 percent, or an estimated 3.4 million youths) was reported by his or her parent to have had this condition, indicative of middle-ear infection (table 1). Earaches were substantially more prevalent among girls than boys (18.6 percent compared with 11.7 percent) but showed no definite age-related trend (figure 5).

White youths were more likely than Negro youths to have had an earache in the preceding year (15.3 percent compared with 13.8 percent), as shown in figure 2, although the difference is not large enough to be statistically significant at the 5-percent probability level. Among both white and Negro youths, girls were more frequently reported to have had such a condition than boys, but the sex differences were statistically significant only among the white population (table 2).

By region, the prevalence of reported earaches in the preceding year ranged from a high of 16.9 percent among youths in the South to a low of 13.2 percent in the Northeast, with intermediate rates of 14.6 percent in the Midwest and 15.6 percent in the West (table 3). These regional differences are generally present across the age

range in the study, but are small enough to be attributable to sampling variability alone. In each of the four regions the rates are about 50 percent higher among girls than boys.

Youths in rural areas were more frequently reported to have a history of earaches (15.8 percent) than were those in urban communities (14.7 percent), though the differences in the rates are negligible (table 4).

Earaches were reported most frequently among youths in families with annual incomes of less than \$3,000 (18.9 percent), and least often among those in families in the higher income brackets of \$10,000 or more annual income (13.4 and 11.8 percent). This pattern was found among both boys and girls.

With increasing educational level of the youths' parents, the prevalence of this condition among youths also decreased from 18.3 percent among those whose parents had less than 5 years of formal schooling to 14.0 percent among those whose parents had some college education, but the differences are small enough to be due to sampling variability alone and are not consistent across age or sex (table 6).

The prevalence of earaches in the preceding year among U.S. youths 12-17 years (15.1 percent) is substantially lower than that from

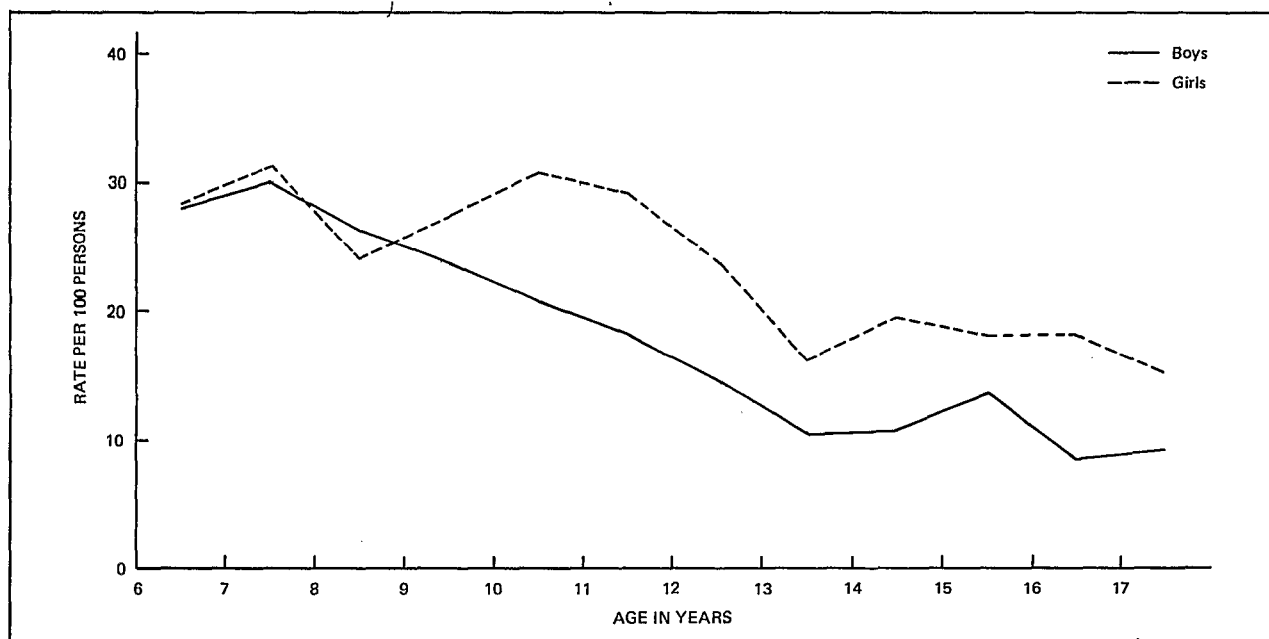


Figure 5. Prevalence rates of parent-reported history of earaches in past year among youths 6-11 years (1963-65) and 12-17 years (1966-70), by age: United States.

the previous survey among U.S. children 6-11 years (26.6 percent); however, these rates are not comparable since the children's experience was not limited to a single year. Despite this, the pattern of relationship between this condition and the demographic and socioeconomic variables, except for region, are similar among both children and youths.

Running ears.—Nearly 1 youth in 10 (9.4 percent, or an estimated 2.1 million youths) was reported by his or her parent to have ever had a running ear or any discharge (except wax) from the ears (table 1). Boys were slightly less likely than girls to have had such a condition, and the pattern by age was not consistent.

This condition, indicative of middle-ear infection, was reported substantially more frequently among white (10.0 percent) than Negro (5.3 percent) youths (figure 2 and table 2). This pattern of racial differences in the prevalence of a history of running ears was present throughout the age range and by sex, but the differences were not consistently large enough to be statistically significant.

The prevalence of running ears among youths in the Midwest (11.2 percent) was slightly higher than that among youths in the other three regions, where the rates ranged from 8.5 through 8.6 percent (table 3). This regional pattern was found among both boys and girls, but it was not consistent by age.

Youths in rural areas were more likely than those in urban communities to have ever had a discharge from their ears (table 4). This persisted across the entire age range, with one minor exception, and by sex, but it was not consistently significant throughout. The differential was largest among the younger youths, age 12-15 years.

Even though a history of running ears was reported more frequently among youths in families with annual incomes of less than \$3,000, there was no consistent pattern by income level (table 5). None of the differences between income levels were large enough to be statistically significant and the pattern by sex and across the entire age range is erratic.

Similar to the findings for income, no definite relationship was found between the prevalence of a history of running ears among these youths

and the educational level of their parents (table 6).

The prevalence of a history of running ears among U.S. youths (9.4 percent) was substantially lower than among U.S. children (11.8 percent), indicating either a lower infection rate among the youths or possibly a memory factor for the youths' parents on this question. In general the relationship of this condition to the various demographic variables, with the exception of parent's education, was similar among children and youths.

Ear injury.—In response to "Have his (her) ears ever been damaged or injured in any way?," nearly 1 youth in 28 (3.6 percent, or an estimated 0.8 million youths) was reported to have had this experience (table 1). Boys were slightly more likely than girls to have had an ear injury, except at age 12, but there was no increasing or decreasing trend with age.

The prevalence of ear injuries, as reported by parents in the medical history, was significantly higher among white than among Negro youths (3.8 percent compared with 1.9 percent). The higher rates among white youths were consistent across age and sex (table 2).

Among youths in the West the rate of ear injury history was slightly greater, and in the Northeast the rate was slightly less than those for the other two regions of the country though the regional pattern was not consistent across age and sex (table 3).

Ear injuries were substantially more frequently reported on history for U.S. youths age 12-17 years (3.6 percent) than for U.S. children age 6-11 years (2.4 percent) from the earlier national survey, as might be expected considering the greater time at risk for the older age group. In general the relationship with demographic variables, except for region, showed a similar pattern for both youths and children.

Drum perforation.—Nearly 1 youth in 30 (3.0 percent, or approximately 0.7 million youths) was reported to have ever had his or her eardrums opened or lanced (table 1). Boys were slightly more likely than girls to have had this happen or done. There was no apparent trend by age. Less than 1 percent of youths had ever had some type of ear operation other than myringotomy (lancing of the tympanic membrane).

White youths were much more frequently reported by their parents to have ever had their eardrums perforated than were Negro youths (3.3 percent compared with 1.2 percent). This finding was consistent by sex and across the entire age range (table 2).

The prevalence of this condition was slightly higher among youths in the West (4.5 percent) and lower among those in the South (1.9 percent) than in the other regions of the country (table 3). Only the differences in rates between youths in the South and those in the West were large enough to be statistically significant. A similar regional pattern was present for boys and girls, but only among girls was the South-West difference statistically significant.

The prevalence of drum perforation reported on the medical history was identical among U.S. youths in the present study and U.S. children from the preceding national survey (3.0 percent). The relationship between this condition and all demographic variables except region is similar among both children and youths.

Other ear trouble.—To the medical history question “Has he or she had any other ear trouble?” nearly 1 youth in 28 (3.6 percent, or an estimated 0.8 million youths) was reported by his or her parent to have had some type of ear trouble other than those previously cited here (table 1). Girls were slightly more likely than boys to have had such a condition and no consistent trend with age was evident.

The prevalence of other ear trouble from the medical history was significantly greater among white than among Negro youths—3.8 percent compared with 2.0 percent (table 2). This racial pattern was consistent across the age range in the study and by sex, though the differences in rates were large enough to be statistically significant only for the girls and at some of the individual years of age.

Youths in the Midwest had slightly higher rates for history of other ear trouble than those in the other three regions of the country; however, the differences were slight and were not consistent across the age range or by sex (table 3).

The prevalence of other ear trouble history among U.S. youths (3.6 percent) was substantially lower than that found among U.S. children

(4.8 percent) from the previous national survey; however, the pattern of relationship by demographic variables was similar in both studies.

Health History—Youth

Four questions directly related to functional hearing or events indicative of other abnormal conditions of the ear were included in the self-administered health history completed by the youth (appendix III).

Trouble hearing.—In response to “Do you have any difficulty hearing?” nearly 1 youth in 20 (4.9 percent, or an estimated 1.1 million youths age 12-17 years) considered that he or she had such a problem (table 7). This is substantially in excess of the 3.7 percent of youths reported by their parents as having difficulty or trouble hearing, and more than three times the 1.3 percent found to have a hearing handicap on the basis of the air-conduction audiometric tests given during the examination.⁷ When comparison is made between the parent’s and youth’s responses to whether the youth had difficulty hearing, less than half the parents (46.1 percent) appear to be aware of the youths’ problems (table 8). Thus of the 4.9 percent of youths stating they had trouble hearing, for only 2.3 percent did the parent indicate an awareness of it. An additional 1.4 percent of youths were reported to have such a problem by their parents but not by themselves.

Girls were about as likely as boys to have reported they had trouble hearing, and there was no consistent trend with age.

Negro youths were more likely than white youths to have reported they had this problem; however, the difference in rates was not large enough to be statistically significant (table 9). Within each racial group, prevalence rates based on self-reports exceeded those reported by the parents, probably indicating that the youths are reporting some presently minor hearing difficulties not yet evident to their parents.

The prevalence of self-reported trouble hearing among U.S. youths age 12-17 years from the 1966-70 national survey (4.9 percent) was just slightly lower than among U.S. adults 18-24 years (also self-reported) from the 1960-62 national survey (5.6 percent).¹⁴ However,

among young U.S. adults 18-24 years, women were substantially more likely than men to have reported trouble hearing in contrast to the slightly greater proportion of male than of female youths reporting they had such a problem.

Earaches.—More than one youth in five (20.4 percent, or an estimated 4.6 million youths), reported having had one or more earaches in the preceding year (table 7). Girls were more likely than boys to have reported having had earaches, and the difference in rates was large enough to be statistically significant (23.3 percent compared with 17.6 percent). The prevalence of earaches decreased with age for all youths from 23.8 percent among 12-year-olds to 16.2 percent among the 17-year-old group. The trend with age was more consistent among boys than girls—decreasing for boys from about 21 percent at ages 12 and 13 to less than 12 percent at 17 years. Among girls, however, the rate was highest at 12 years (27 percent) and dropped to a level of 22-23 percent at ages 13-16 years and to just under 21 percent at 17 years.

White youths were more likely to have reported having had earaches than were Negro youths, but the difference in prevalence rates was negligible (table 9)

The prevalence rates for earaches among youths based on self-reports (20.4 percent), are more than one-third higher than those based on the nearly comparable medical histories of earaches given for them by their parents (15.1 percent). This finding is present and consistent for both boys and girls. Comparison of the two reports for the same youths regarding the youths' having had earaches in the past year shows that slightly less than half of the parents (9.1 percent of the 20.4 percent of youths giving positive responses) were apparently aware of or remembered the problem that the youth reported having had (table 8). In addition 1.1 percent of the reports (of youths having had earaches) by parents were not confirmed by the youths. This probably reflects the fact that the self-reported history contains a larger proportion with less severe conditions which the youth may not have mentioned to his parents.

Ear injury.—From the youth's response to "Were your ears ever damaged or injured in any

way?," about 1 youth in 20 (4.7 percent, or an estimated 1.0 million youths), reported having had such injury (table 7). No consistent trend with age is evident, and boys were just slightly more likely than girls to have indicated they had had such an injury. Only about half (45.9 percent) of the parents of youths reporting they had had an ear injury confirmed the statement—for 2.2 percent of the 4.7 percent of the youths reporting this (table 8). An additional 0.05 percent of parents reported this for the youth in instances where the youth gave a negative response.

Ear injury rates, based on self-reports, were negligibly higher among white than among Negro youths (table 9), in contrast to the significantly higher prevalence rates among white than among Negro youths based on reports for them by their parents.

Other ear trouble.—Nearly 1 youth in 12 (8.0 percent, or an estimated 1.8 million youths) reported also having had some other ear trouble (other than difficulty hearing, earaches, and ear injuries), as shown in table 7. The rate was slightly higher among boys than among girls, but it showed no consistent trend with age. The rates were significantly greater among white than among Negro youths (table 9), but for both racial groups the sex differences in the rates were negligible.

Since the medical histories which the parents gave for these youths identified several additional specific ear conditions which the youths probably included in answering this particular question, the data from the parents' and youths' responses to this question are not directly comparable.

Examination

National estimates of the prevalence of physical evidence of past or present pathology in the ear, nose, and throat among youths in this report are based on direct examination findings by the survey staff pediatricians who had been specially trained to identify such evidence, as described previously. No diagnoses of specific disease entities, such as otitis media, are included. Estimates based on the joint occurrence of findings usually considered indicative of severe acute otitis media are contained in a

previous report.¹⁵ Since cerumen or other occluding substances were not removed from the ears, the true prevalence of specific findings presented here will probably be somewhat underestimated.

External ear.—One youth in 100 (1.2 percent, or an estimated 0.3 million youths age 12-17 years) had some abnormality of at least one external ear. These included congenital deformities as well as acquired conditions such as adenopathy, fistulae, and operative scars. The right ear was about as frequently affected as the left (table 10). However, when such a condition was present, one ear was more likely to be affected than both (62 percent compared with 38 percent).

The prevalence of such conditions was slightly higher among girls than boys throughout the age range, with minor exceptions at 14 and 17 years. This higher rate among girls was apparently due primarily to infections resulting from piercing of the lobe.

Among U.S. youths, the prevalence of abnormalities of the external ear (1.2 percent) was slightly lower than among U.S. children (2 percent). Among children both external ears were somewhat more likely to be affected, whereas among youths the majority of such conditions were limited to one ear.

Auditory canal.—Nearly 1 youth in 6 (16.2 percent, or an estimated 3.7 million U.S. youths age 12-17 years) had some abnormality of one or both auditory canals. For the majority (97.3 percent), the canal was partially or completely occluded, usually with encrusted or impacted cerumen. If the canal was occluded, it was slightly more likely to be completely (53 percent) than partially so (47 percent). Abnormal findings, if present, were somewhat less likely to involve both canals (43 percent) than just one (57 percent). The right auditory canal was about as frequently affected as the left (table 10).

Girls were slightly more likely than boys to have some abnormal condition of this site, but no age-related trend was evident.

The prevalence of abnormalities of the auditory canal among U.S. youths (16 percent) was substantially lower than among U.S. children (21 percent) from the preceding national survey; however, for about the same proportion among both age groups (98 percent), the condition was

one of impacted or encrusted cerumen. For both children and youths, the canal was more likely to be completely than partially occluded and both canals were somewhat less often affected than just one. Boys, both among children and youths, were less likely than girls to have some abnormality of this site. However, among youths, unlike children, there was no consistent decrease in the prevalence of this condition with age, probably reflecting the increase of the size of the canal with age and hence the ease with which it could be cleaned.

Drum.—Some abnormality of the tympanic membrane or drum was found among 1 youth in 7 (15.2 percent, or an estimated 3.4 million youths) in the United States. The right drum was about as likely to be affected as the left (table 10), and both were less likely to be involved than just one (42 percent). An additional 10.4 percent of the youths (approximately 2.4 million) had at least one auditory canal so occluded that otoscopic visualization was not possible. Impaired mobility of at least one drum, one of the findings indicative of chronic serious otitis media, was present among 2.7 percent of the youths (approximately 0.6 million).

Boys were slightly less likely than girls to have an abnormality of the left tympanic membrane, whereas girls were less likely to have an abnormality of the right drum. There was no apparent trend with age in the prevalence rate of these conditions (figure 6).

The prevalence of an abnormality of the drum was substantially lower among U.S. youths (15.2 percent) than among U.S. children (approximately 20 percent). Among youths, both drums rather than just one were involved less frequently, and there were fewer completely occluded drums than among U.S. children from the earlier survey.

Drum lustre.—An estimated 1.3 million youths (5.9 percent) had drums that were dull (opaque) in appearance, lacking the degree of lustre typical of the normal tympanic membrane. The right ear was about as likely as the left to have such findings (table 10) and both were less likely to be affected (43 percent) than just one. The prevalence of this condition differed slightly between boys and girls and there was no consistent trend with age. This

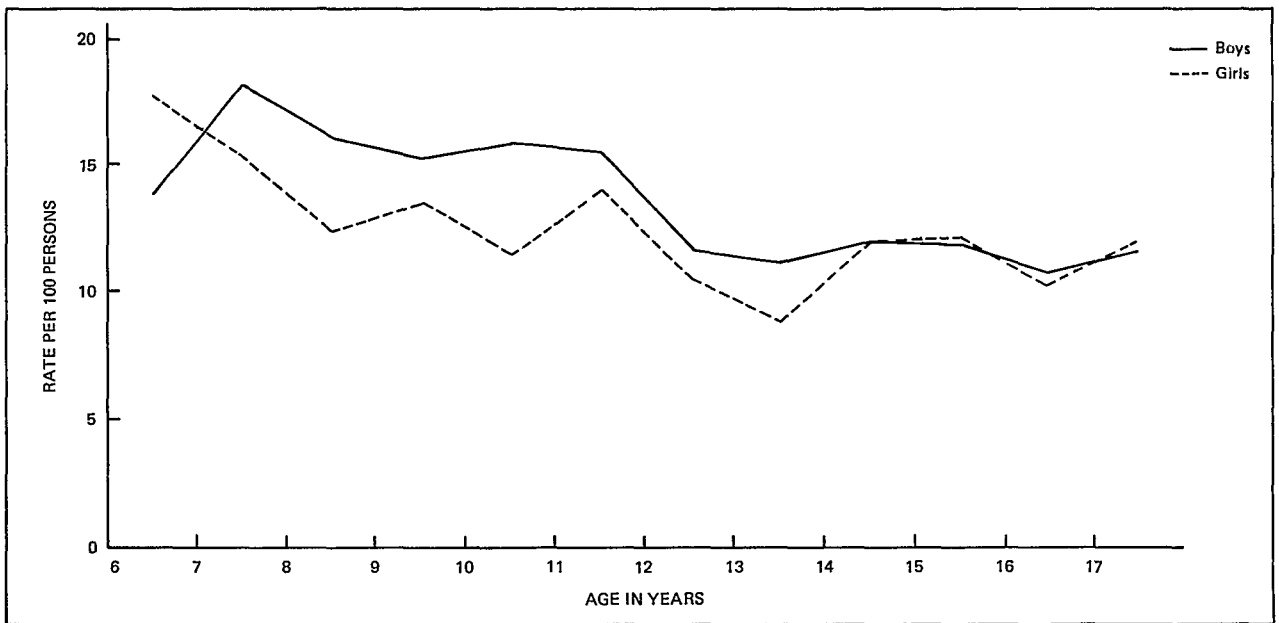


Figure 6. Prevalence rates of abnormal examination findings in the right eardrum among youths 6-11 years (1963-65) and 12-17 years (1966-70), by age: United States.

condition was just slightly more prevalent among U.S. children from the previous survey (7 percent), probably primarily because of the slightly different criteria used to identify this type of abnormality in the two examinations. However, similar patterns with respect to age and sex were found among both children and youths.

Drum transparency.—An estimated 0.1 million youths (0.6 percent) in this country were rated as having an abnormally transparent tympanic membrane in one or both ears. This condition was seen nearly as often among boys as girls and no age-related trend was evident (table 10).

The prevalence of this type of abnormality among youths was substantially less than that among U.S. children from the previous survey primarily because of the more stringent criteria used to identify abnormal transparency in the youths' examination than in the children's.

Drum bulging or retracted.—An estimated 0.8 million U.S. youths (3.5 percent) had at least one tympanic membrane that was bulging or retracted, a condition indicative of past or present pathology. The right drum was about as likely as the left to have such findings (table 10)

and both were less likely (34 percent) to be involved than just one.

In the majority (85 percent) of cases where this type of pathology was observed, the drum was retracted, indicating either latent or early stages of an active disease process. Binaural involvement was present in about 37 percent of the cases where at least one drum was retracted. Among those with at least one drum retracted, none had a bulging membrane in the opposite ear.

Less than 1 percent of all youths had at least one tympanic membrane that was bulging, a finding suggestive of acute or chronic recurrent otitis media. The condition was usually limited to one ear (84 percent of those with at least one drum affected). The prevalence of this evidence of active or chronic recurrent disease process (bulging membrane) was so low that national estimates for it are not as reliable as those for the more prevalent finding of retraction.

The prevalence of bulging or retracted drums among U.S. youths (3.5 percent) was substantially lower than among U.S. children (9 percent) from the previous national survey. When such conditions were found, youths were slightly less likely than children to have a

retracted drum (87 percent compared with 96 percent) and less likely to have binaural involvement (one out of three cases among youths compared with two out of three among children).

Drum perforated.—An estimated 0.3 million youths (1.3 percent) had at least one drum perforated from a disease process, accident, or operation. The right and left ears were equally likely to be affected (table 10). This condition was somewhat more likely to be found in one (83 percent) than both (17 percent) ears; however, the prevalence is so low that these national estimates cannot be considered reliable. If a perforation was present, the youth was more likely not to have than to have a discharge from the affected ear.

The prevalence of perforation of the drum among U.S. youths (1.3 percent) was negligibly higher than among U.S. children (less than 1 percent).

Drum discolored.—An estimated 0.3 million youths (1.4 percent) had at least one drum discolored—either red indicating active pathology, or other discoloration suggestive of a chronic recurrent disease process. The right ear was slightly more likely to be affected than the left among both boys and girls (table 10). The discoloration was more likely to be red (97 percent) and to be found in one (84 percent) than in both (16 percent) ears. When both tympanic membranes were involved the discoloration was the same in both (red).

If the drum was bulging or retracted, the membrane was more likely to be discolored (13.5 percent) than if the drum was normal (0.5 percent). Discoloration was also more likely to be present if the drum was bulging (60 percent) than if it was retracted (7 percent).

The prevalence of drum discoloration is only negligibly lower among U.S. youths (1.4 percent) than U.S. children (2 percent) from the 1963-65 national survey, and among both youths and children the discoloration was more likely to be red and found in one ear rather than in both.

Drum scars.—An estimated 1.1 million youths (4.7 percent) had scars in one or both drums from previous spontaneous or induced perforation that had healed. The left drum was nearly as likely as the right to be affected (table 10),

and both ears were less likely to be involved (40 percent) than just one (60 percent).

The prevalence of this finding among U.S. youths (4.7 percent) was more than double that from the previous national survey among U.S. children (2 percent), possibly reflecting the longer length of time at risk for the youths.

Fluid visible.—For a very small proportion of youths (0.5 percent), fluid was visible in the middle ear through the tympanic membrane, indicating some type of infection or other pathology. The right ear was about as likely as the left to have such findings (table 10), and both (9 percent) were less likely to be affected than just one (91 percent). For those with fluid visible, 63 percent had their drums rated as dull and 34 percent as normal.

Calcium plaques.—Calcium plaques were present on at least one drum for an estimated 0.6 million youths (2.8 percent). The right drum was about as likely as the left to have such a finding (table 10) and both were less likely to be affected (25 percent) than just one (75 percent). Boys and girls were nearly equally likely to have such deposits and there was no definite age-related trend in the prevalence rates. Only about one youth in eight (11.6 percent) with calcium plaques noted on examination also had findings of scar on the drum.

Drum abnormalities—socioeconomic and demographic differentials.—Consideration of the variations in the prevalence of otoscopic abnormalities among youths by race, geographic region, parent education, and family income will be limited here to the major findings for the right ear, since these conditions are present about as frequently in one ear as in the other.

Negro youths were significantly less likely than white youths to have some abnormality of the right tympanic membrane, the prevalence rates being 6.5 percent and 11.9 percent, respectively (table 11). This racial differential was present among both boys and girls. However, among white youths, the rates were slightly higher for boys than for girls, while among Negro youths the rates for girls were higher. No definite age-related trend with respect to some abnormality of the drum was evident in either racial group.

Specific findings of bulging or retraction of the drum were slightly more prevalent among

white than Negro youths, while the reverse was true for lack of mobility and complete occlusion of the tympanic membrane. This racial pattern was consistent among both boys and girls and, with minor exceptions, across the entire 12- to 17-year age range.

Regional differences in the rates for drum abnormality were less marked than those for race. Abnormalities of the right tympanic membrane were more prevalent among youths in the West (17.3 percent) and less prevalent among those in the Midwest (7.8 percent) than among those in the Northeast (10.0 percent) and South (9.8 percent), as shown in table 12 and figure 7. The higher rates for Western youths were present among both boys and girls and across the entire age range; however, the differences were not large enough to be considered statistically significant throughout. The prevalence of such conditions was lowest among both boys and girls and among the lowest across the age range for youths in the Midwest.

The regional pattern with respect to the specific drum abnormalities was not consistent. Slightly higher prevalence rates were found for bulging or retraction of the drum among youths

in the West, for lack of drum mobility among those in the South, and for complete occlusion among youths in the Midwest.

Rural youths were more likely than those in urban communities to have an abnormality of the drum (table 13). This pattern was consistent among both boys and girls and with one minor exception across the 12- to 17-year age range; none of the urban-rural differences were large enough to be statistically significant. Similarly, for each of the specific findings of bulging or retraction, lack of mobility, and complete occlusion of the tympanic membrane, the prevalence rates were slightly higher among rural than urban residents.

Socioeconomic differentials, though slight, were also found among youths with respect to the prevalence of these drum abnormalities. Youths in the lower-income-level families—less than \$5,000 annual income—were more likely than others to have any abnormality of the right drum or to have a specific finding of bulging or retraction, or lack of mobility of the drum (table 14). The prevalence of complete occlusion of the drum was higher among those in families with annual incomes of less than \$7,000 than among the others.

When considered in relation to education of the (first) parent, prevalence rates for any drum abnormality were higher among youths whose first parent had less than 5 years of formal schooling (17.9 percent) than among those having 5-11 years or 12 years or more (prevalence rates of nearly 11 percent, table 15). For each of the most prevalent specific drum abnormalities, the rates decreased consistently with increase in educational level of the parent and were nearly twice as great among youths whose parents had less than 5 years of formal schooling than among those whose parents had 12 years or more.

Comparison of the findings for U.S. youths from the present studies with those for U.S. children from the 1963-65 national survey shows similar patterns of higher prevalence rates for abnormality of the drum among Negro than among white children and youths, and among those living in rural than in urban communities. The distribution of abnormal findings by region and socioeconomic level differs somewhat for the two age groups.

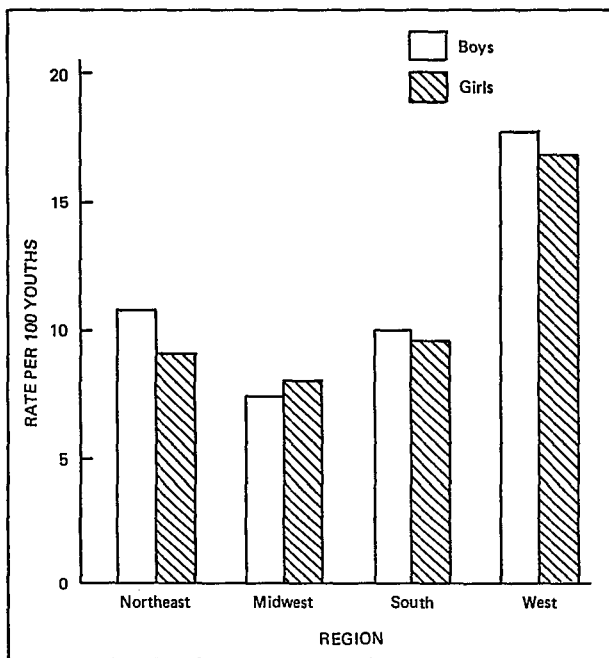


Figure 7. Prevalence rates of abnormal examination findings in the right eardrum among youths 12-17 years, by region: United States, 1966-70.

Tonsils.—An estimated 8.7 million youths (38.3 percent) had tonsils that were removed (or otherwise not visible) either completely (28.4 percent) or partially, with tags still present (9.9 percent). The proportion who have had a tonsillectomy (or whose tonsils were otherwise not completely visible) increased with age from 34.4 percent at 12 years to 42.1 percent at 16 years, then dropped slightly at 17 years (figure 8). The only substantial increase occurred between ages 14 and 15 years. Among younger youths age 12-15 years, boys were more likely than girls to have had their tonsils removed, while the reverse was found among older youths (table 10). In the remainder of this section it will be assumed that the majority if not all of the youths with tonsils not visible or with only tags present had had a tonsillectomy, since it was not possible from the recorded examination findings to identify youths whose tonsils were congenitally absent or where extensive shrinkage had occurred.

Enlargement of the tonsils to the extent that they extended beyond the tonsillar pillars but

did not touch at the midline even when the youth gagged (Grade II) was present among an estimated 6.3 million youths (27.9 percent). This degree of abnormality was found in girls about as frequently as in boys. The prevalence rate generally decreased with age from a maximum of 33.3 percent at 12 years to a minimum of 22.0 percent at 16 years, either as a result of surgical removal or normal physiological regression (shrinkage) in size of the tonsils with increasing age.

Essentially normal tonsils confined within tonsillar pillars (Grade I) were present in an estimated 7.6 million youths (33.6 percent). The percent with normal tonsils was only slightly higher among girls than boys and showed no consistent trend with age.

Substantially more white than Negro youths had had their tonsils completely or partially removed (table 16 and figure 9). The differences in the proportion who had such surgery were large enough to be statistically significant for both boys and girls and at each year of age. The

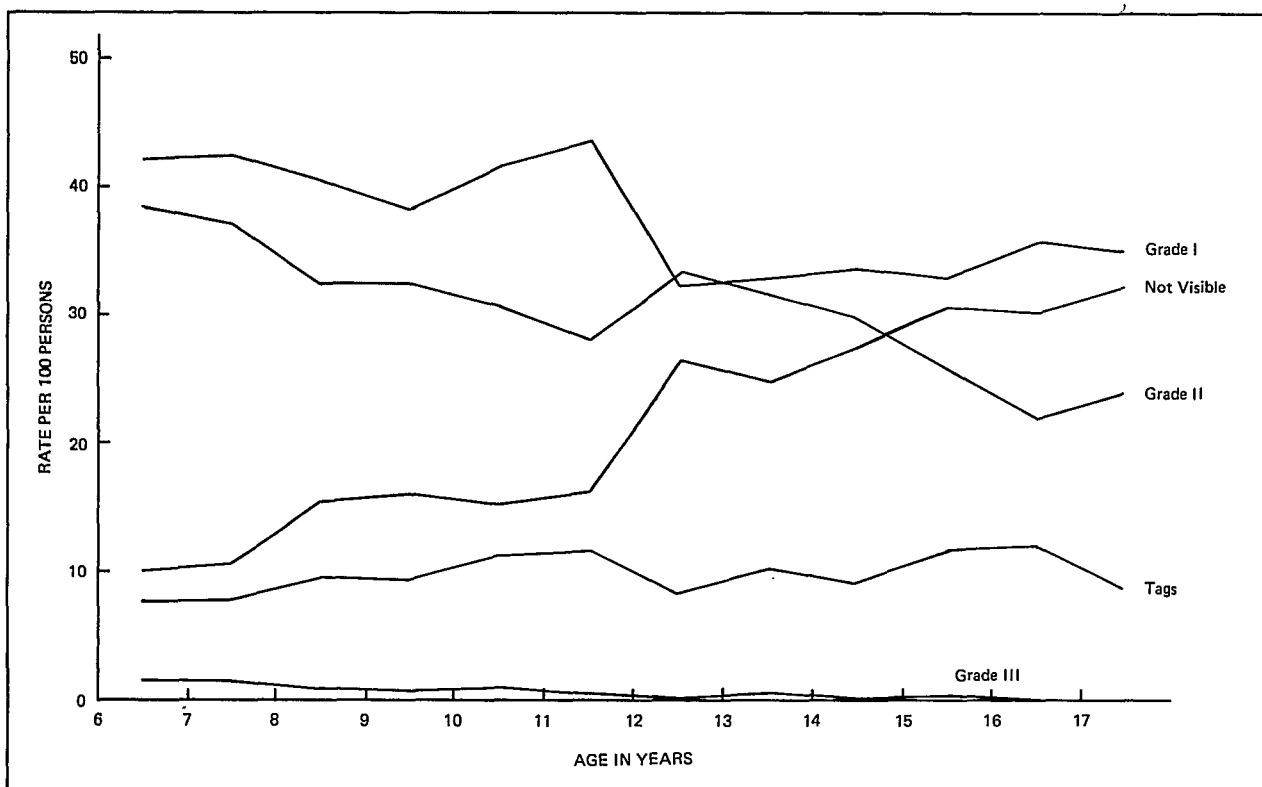


Figure 8. Prevalence rates of condition of tonsils among youths 6-11 years (1963-65) and 12-17 years (1966-70), by age: United States.

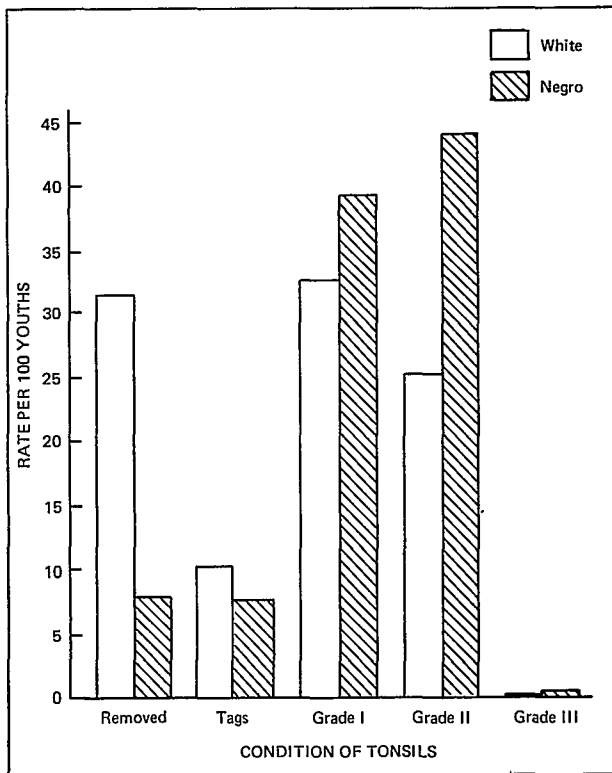


Figure 9. Prevalence rates of condition of tonsils among white and Negro youths 12-17 years: United States, 1966-70.

rate of complete removal was 31.6 percent among white youths compared with 8.0 percent among Negro youths, while for those with tonsillar tags the respective rates were 10.2 and 7.9 percent.

Negro youths, however, were nearly twice as likely as white youths to have enlarged tonsils, a differential found among both boys and girls and across the age range. The rates for slight to moderate enlargement were 44.2 percent among Negro youths compared with 25.4 percent among white youths. Only among white youths did this rate show any consistent trend with age—a steady decrease to age 16 years. Severely enlarged tonsils (Grade III) were present infrequently but relatively more often in Negro than in white youths—0.6 percent compared with 0.1 percent, respectively.

Negro youths were also slightly more likely than white youths to have normal tonsils still present—39.2 percent compared with 32.6 percent, respectively.

In the South the proportion of youths with completely removed tonsils was markedly lower

than for youths in other sections of the country (table 17 and figure 10). The rate for Southern youths (16.6 percent) was significantly below that for youths in the Northeast (34.8 percent) and Midwest (34.3 percent), but only slightly below that for those in the West (27.2 percent).

Moderately enlarged tonsils were more frequently present among youths in the South (40.4 percent) than among those in the other three regions of the country, where the prevalence rates ranged from 23.1 in the Midwest to 24.7 percent in the Northeast.

Youths in the West were slightly more likely than those in the other regions to have essentially normal tonsils—rates of 38.0 percent compared with 27.8 percent in the Northeast, 34.4 percent in the Midwest, and 33.1 percent in the South.

The disproportionately higher rates for moderately enlarged tonsils and lower rates for completely removed tonsils among youths in the South than those in other regions reflect the disproportionate number of Negroes in that region (proportionately about twice as many Negroes in the South as in the other regions).

Youths in the lower-level-income families (annual income of less than \$5,000) were more likely to have slightly to moderately enlarged tonsils but less likely to have had their tonsils partially or completely removed than those from higher-level-income families (\$5,000 or more). The percent of youths with tonsils removed, partially or completely, increased steadily with income from 17.2 percent among those in the lowest income bracket to 47.8 percent among youths in families with annual incomes of \$10,000-\$14,999, and then dropped slightly (table 18 and figure 11).

The percent of youths with severely enlarged tonsils, though too small to provide the basis for reliable national estimates in any degree of demographic detail, decreased consistently with increase in family income.

The proportion of U.S. youths with tonsils removed (38.3 percent) was substantially higher than that of U.S. children from the 1963-65 national survey but there was a general increase with age over the 6- to 17-year span (figure 8). Tonsillar tags were about as frequently found among U.S. youths (9.9 percent) as among U.S. children (9.6 percent), with no consistent age trend in either group.

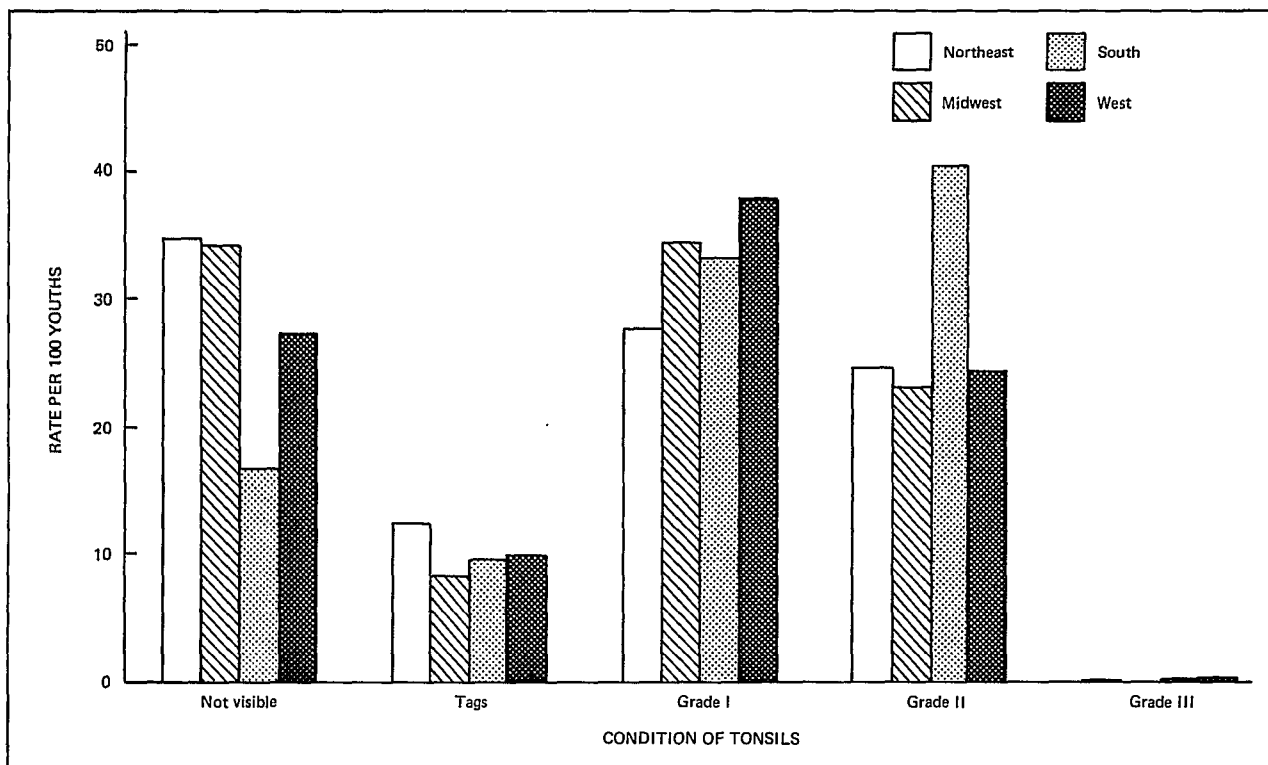


Figure 10. Prevalence rates of condition of tonsils among youths 12-17 years, by region: United States, 1966-70.

Moderately enlarged tonsils were found less frequently among U.S. youths (27.9 percent) than among U.S. children (33.9 percent), and the general pattern of decreasing prevalence with age was slightly more consistent among the older age group (youths). The prevalence of severely enlarged tonsils was also lower among U.S. youths (0.2 percent) than among U.S. children (1.2 percent).

Normal tonsils were found more frequently in U.S. children (41.5 percent) from the previous survey than in U.S. youths (33.6 percent) from the present 1966-70 national survey.

Oral pharynx.—An estimated 1.5 million youths (6.6 percent) had some abnormality of their oral pharynx (table 10). The majority of these consisted of swollen or hypertrophic lymphoid tissue on the posterior wall of the pharynx, frequently a manifestation of an allergy or a common cold. Boys were slightly more likely than girls to have such findings, but the difference was not large enough to be statistically significant and there was no age-related trend.

The prevalence rates for abnormal findings of the oral pharynx are slightly higher for white youths (6.8 percent) than for Negro youths (5.6 percent), but the differences are small enough to be due to sampling variability alone (table 16). This racial differential was found among both boys and girls and across the age range 12-17 years, except at 13 and 16 years.

Relatively more youths in the South (9.1 percent) and the West (7.5 percent) had some abnormality of the oral pharynx than those in the Northeast (6.5 percent) and Midwest (3.9 percent), though only for the rates in the Midwest and the South was the difference large enough to be statistically significant (table 17). This regional pattern was found among both boys and girls but not consistently across the age span. In each region, except for the South, the rates for boys exceeded those for girls.

Some slight association of these findings with income is suggested. The prevalence rates are highest among youths in families with annual incomes under \$5,000, though the differences among the various income levels are not large

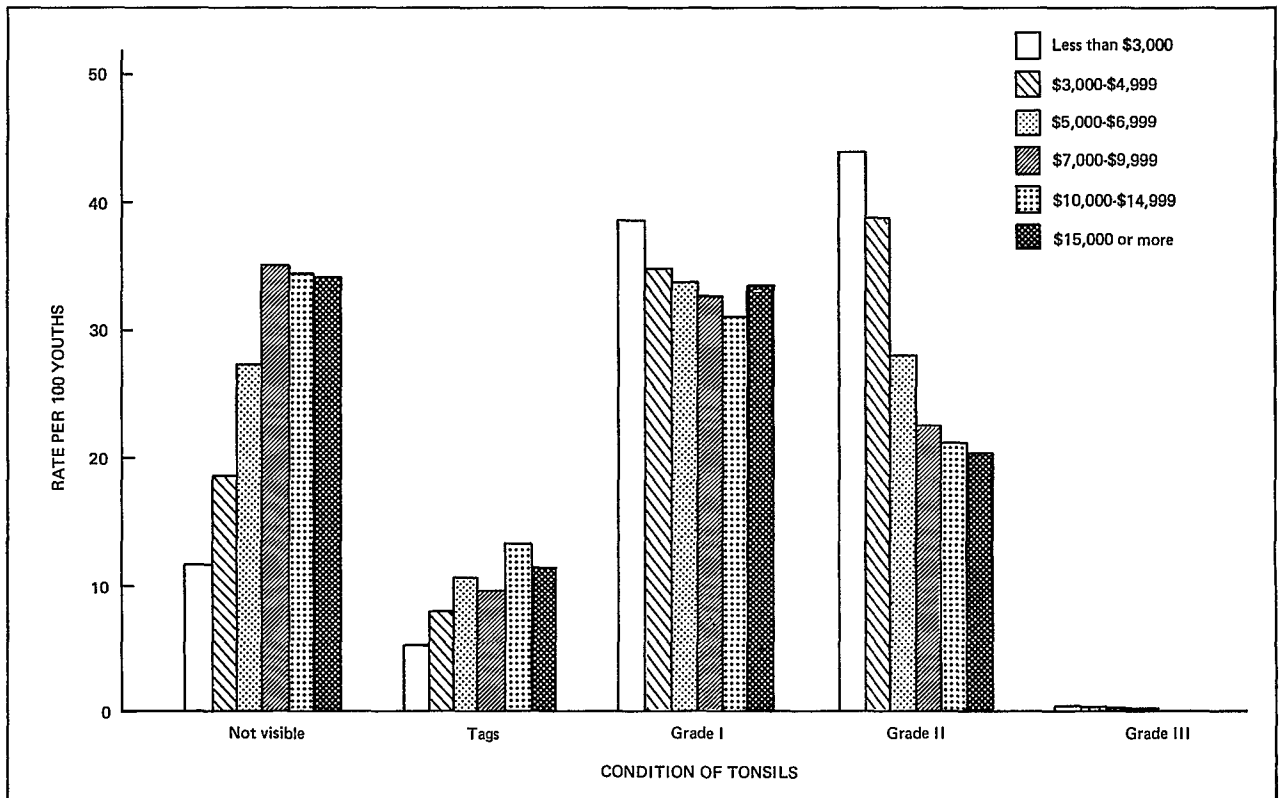


Figure 11. Prevalence of condition of tonsils among youths 12-17 years, by annual family income: United States, 1966-70.

enough to be statistically significant nor is the pattern consistent for boys and girls or by age (table 18).

The prevalence rates for abnormality of the oral pharynx was slightly but not significantly less among U.S. youths (6.6 percent) than among U.S. children (10.0 percent) from the 1963-65 national survey. Across the age range 6-17 years, the rates among white children and youths tended to be slightly greater than among their Negro counterparts, but the regional and income level distributions of such abnormalities were not similar for children and youths.

Nose.—An estimated 2.2 million youths (9.8 percent) had some abnormality of the nose at the time of the examination. The right and left nares were equally likely to have an abnormality (table 10), and both nares were more likely to be affected (64 percent) than just one (36 percent). When an obstruction was present, it was more likely to be acute (84 percent) with blockage from profuse discharge due to an infection or allergy, than chronic (16 percent) from a deviated septum or other abnormality.

Across the age range 12-17 years, boys were slightly more likely than girls to have this problem, though the differences in rates were not large enough to be statistically significant.

The prevalence of abnormality of the nose among U.S. youths (9.8 percent) was substantially less than that found in the previous national survey among U.S. children (about 20 percent).

Relation of Medical History and Examination Findings

The extent of agreement between the history of hearing difficulties or other ear defects as reported by the parents and the findings on the ENT examination for the youths are indicated in table 19.

Youths found an examination to have one or more abnormalities of the drum were significantly more likely to have been reported by their parents as having had difficulty hearing, earaches in the past year, injury to the ear, drums opened or lanced, or running ears than

were youths for whom the drum was considered normal by the survey examining physician (figure 12 and table 19). Those youths with tonsils removed also were more likely to have had a history of such hearing and ear problems than those with normal tonsils; however, the differences in the rates are not large enough to be statistically significant. These relationships are generally similar to those found among U.S. children from the 1963-65 national survey.

Relationship of Hearing Sensitivity, Medical History, and Examination Findings

Medical history—parent.—Youths reported by their parents to have had difficulty hearing, earaches in the past year, ear injuries, drums opened, or running ears tended to have less sensitive hearing across all eight frequencies in the air-conduction audiometric tests than those without such a history (tables 20-26). Mean hearing thresholds for the better ear of youths with each type of history (of hearing or ear problem) were significantly higher (poorer hearing) than for those without (with one exception at 8000 Hz for earache history where the difference was not large enough to be statistically significant). This pattern was generally

consistent among both boys and girls and across the age range 12-17 years.

The strongest relationship with audiometric test results among these youths was found for those with a history of difficulty or trouble hearing. Mean thresholds for youths with this problem ranged from 5 to 10 dB higher across the test frequencies than for those without. The history of ear injuries also showed a significant association with test results—mean thresholds for those with such a history were 3 to 7 dB above those without. The relationship to hearing levels was significant but less strongly associated with a history of drum opened, running ears, or earaches. These findings for U.S. youths of the strongest relationship being between their hearing levels and their history of difficulty hearing were similar to those among U.S. children from the 1963-65 national survey.

Health history—youth.—Youths who reported having had trouble hearing or an ear injury had significantly higher hearing thresholds (poorer hearing) in the better ear, on the average, than those who did not report such a condition (tables 27 and 29). Those with trouble hearing had mean hearing levels 5 to 9 dB higher across the test frequencies than those who did not. The association with a history of ear injuries, while

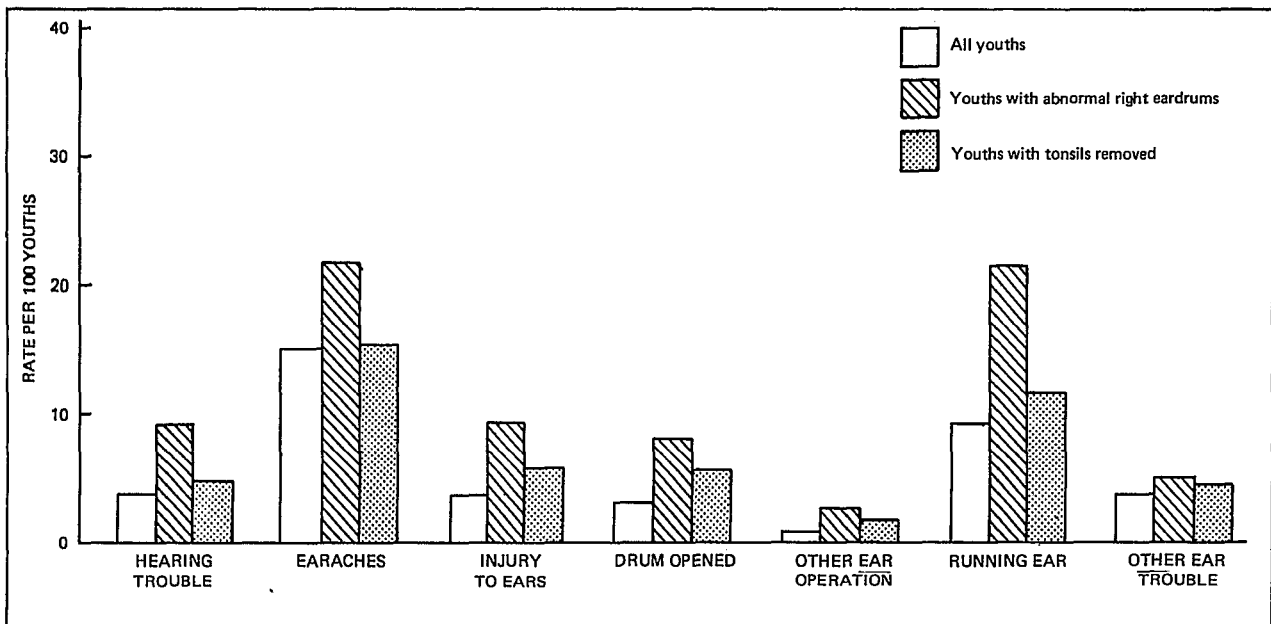


Figure 12. Prevalence of history of hearing and ear abnormalities among all youths 12-17 years and among youths with examination findings of abnormal right eardrum or with tonsils removed: United States, 1966-70.

significant, was less strong—mean levels for youths who had such injuries were 2 to 5 dB greater (poorer) than for those who had not. Only for trouble hearing was the relationship strong enough to be consistently statistically significant among both boys and girls and generally across the age range (except at 17 years).

The relationship between hearing thresholds and history of earache in the past year or other ear trouble was less consistent (tables 28 and 30). While youths with such a history also had hearing thresholds that were higher on the average than those who did not, the mean differences with respect to presence or absence of earache history were large enough to be statistically significant at only six of the eight frequencies (250, 500, 1000, 2000, 6000, and 8000 Hz) and for other ear trouble at only five frequencies (1000 and 3000-8000 Hz).

The patterns of association between hearing levels of these youths and findings from the three comparable history items on the medical history as given for them by their parents and their own self-administered health history are similar. From both types of history, the item regarding difficulty hearing was the condition most closely associated with the youths' actual hearing thresholds. The relationship of hearing levels to the history of ear injuries was slightly stronger on the parent report for the youths than on the youths' own histories.

Examination.—In analyzing the association of the ENT findings indicative of present or past pathology with the hearing levels of youths, the abnormalities for a specific ear or nare are related to the audiometric test results for the appropriate ear (tables 31-39, 43). Findings in the throat and nose are related here to the thresholds for the better ear (tables 40-42).

From the examination of the ear, only conditions of the tympanic membrane showed any significant relationship to hearing levels of youths (figure 13). Those with an abnormality of the drum, either right or left, had significantly higher mean hearing thresholds (poorer) across all eight test frequencies than youths with no abnormalities.

The two specific conditions showing the closest association with hearing levels were perforation and lack of mobility of the drum. Youths with either type of condition had

significantly higher mean hearing levels (poorer) for the ear affected, right or left, across all eight test frequencies. Among youths with perforations of the drum in contrast with youths without, hearing levels were significantly elevated (except at 250 and 3000 Hz for those with discharge from the left ear and at 4000 Hz for those without discharge from the right ear).

Youths with conditions of retraction or scarring of the tympanic membrane also generally had significantly elevated hearing thresholds in the affected ear, although the difference in mean levels between those with and without such physical symptoms was not large enough to be statistically significant for those with a retraction at 3000 Hz for the right ear and 8000 Hz for the left and for those with scarring at 250 and 3000 Hz for the right ear and 250, 1000, 2000, and 3000 Hz for the left ear.

Bulging or redness of the drum also was more likely to be present among youths with elevated hearing levels than those without, though only at one test frequency for each (3000 Hz for bulging in the left drum and 4000 Hz for redness in the right drum) were mean thresholds significantly higher than for youths without such physical symptoms.

The significantly elevated hearing thresholds in the right ear for the small group of youths with external right ears abnormal are due primarily to three youths—one with a right mastoidectomy and two with congenital deformities involving both the external and middle ear.

From the examination of the throat, youths with abnormalities of the oral pharynx tended to have slightly higher hearing levels in their better ear than those without, though only at 1000 Hz was the mean difference large enough to be statistically significant, while at 6000 Hz mean thresholds were identical for both groups.

The presence or absence of tonsils was generally unrelated to the hearing thresholds for these youths. However, the small group of youths with severely enlarged tonsils (0.2 percent with Grade III) had elevated mean hearing thresholds at six of the eight test frequencies, although the differences, when compared with those with normal tonsils or tonsils removed, were not statistically significant.

No relationship was evident between hearing levels and abnormalities of the nose. From this part of the ENT examination, youths with

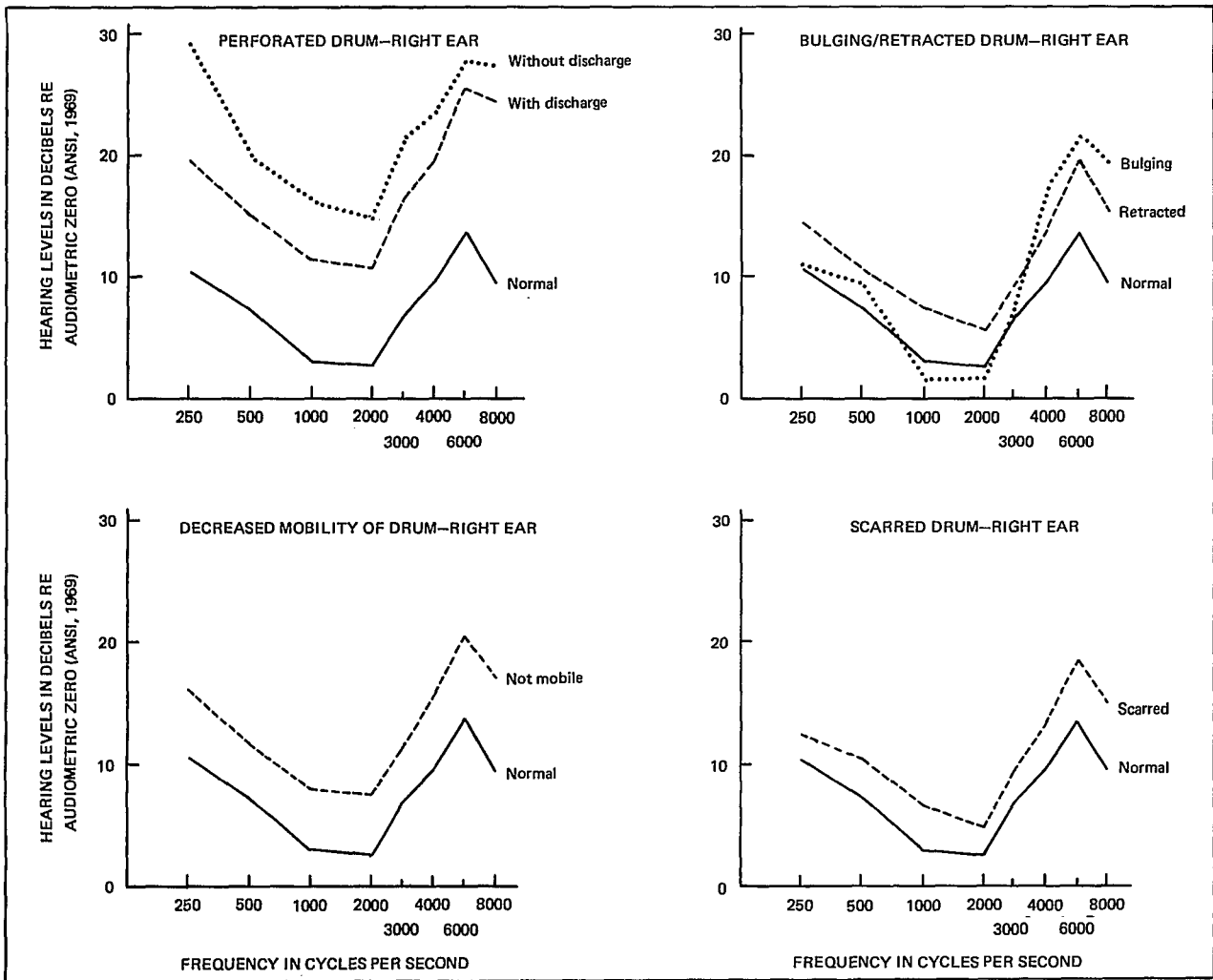


Figure 13. Average hearing levels in the right ear at eight test frequencies for youths 12-17 years with normal drums and for those with significant abnormal otoscopic findings of the right drum: United States, 1966-70.

abnormal findings in their noses had thresholds only slightly higher (poorer) or the same as those without. However, those with chronic obstruction of one or both nares had consistently higher mean hearing levels (poorer) than those for whom the obstruction was acute from a condition such as a common cold.

The effect of the presence in one or both drums of the conditions most closely associated with elevated hearing levels (poorer) may be seen at two test frequencies in table 44. Mean hearing thresholds of youths were significantly higher for those with abnormal than normal drums, regardless of whether the other drum was normal or abnormal. When the effect of the specific conditions of the drum is considered—perforation, lack of mobility, retraction, discoloration or scarring—the mean hearing thresholds for the affected ear tended to be elevated regardless of whether both drums had the particular abnormality, the other drum was normal, or the other drum had some other type of abnormality.

The pattern of association of ENT findings to hearing thresholds among U.S. youths is generally similar to that found among U.S. children from the preceding 1963-65 national survey.

The pattern of association of ENT findings to hearing thresholds among U.S. youths is generally similar to that found among U.S. children from the preceding 1963-65 national survey.

Findings from the Subgroup of Youths Examined in Both the 1963-65 and 1966-70 Health Examination Surveys

The sample design for the 1966-70 Health Examination Survey among youths provided for

use of the same sampling areas and housing units as the preceding national survey among children in 1963-65. As a result, nearly one-third of the youths in the later 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 about 4 years.

The methods used for the ENT examination were generally similar in both surveys, as were the medical history items relating to hearing difficulties and ear conditions completed by the parent for the examinee, except as previously noted. However, because of the method of selection and the fact that not all eligible children returned for reexamination in the youths' survey, only rough comparisons can be made between the findings for these youths at the two points in time.

From the medical histories as given by the parents, the proportion with trouble hearing was slightly lower among the youths (3.5 percent) than it had been for them as children at the time of the previous survey (4.4 percent, table 45). The proportion who had running ears decreased significantly from 11.8 percent when they were children to 9.4 percent as youths, possibly reflecting the problem of recall for the parent over the longer period of time. The substantial decrease in the proportion with earaches from 25.9 percent to 14.8 percent is due primarily to the limitation of the experience to the preceding year on the youths' questionnaire only.

The examination revealed a negligible decrease in the proportion with an abnormality of the right drum, from 12.6 percent among this group at ages 6-11 years to 10.5 percent at ages 12-17 years (table 46). The decrease in the proportion with bulging or retracted drums from 5.9 percent as children to 2.4 percent as youths is statistically significant. There was a substantial increase in the proportion with tonsils not visible (presumably surgically removed) from 17.5 percent as children to 27.6 percent as youths, and a corresponding significant decrease in the proportion with normal tonsils still intact from 41.1 percent when they were children to 32.6 percent when they were youths, which is consistent with the reported increase in history of operations for all children and youths over the age range 6-17 years.¹⁵

Slight decreases in the prevalence rate between the two points in time for these youths are found for moderately and severely enlarged tonsils and for abnormalities of the oral pharynx.

Comparison of their audiometric test results at the two points in time (shown for convenience in table 47 in dB re ASA-1951 audiometric zero) indicates that the mean hearing levels of these youths at the time of the present study are the same or higher (poorer) than they were in the earlier study, with a slight minor exception at 8000 Hz. The mean differences were large enough to be statistically significant at five of the eight frequencies—500 and 2000-6000 Hz.

SUMMARY

Prevalence of abnormal conditions of the ear, nose, and throat and the relationship of these abnormalities to hearing sensitivity of noninstitutionalized youths 12-17 years of age in the United States, based on findings from the Health Examination Survey of 1966-70, have been described and analyzed in this report. The relation of the youths' hearing sensitivity to events in their self-reported medical history and those reported for them by their parents are also included. Findings have been analyzed by racial, regional, and socioeconomic differentials.

For the 1966-70 Health Examination Survey, a probability sample was selected to represent the 22.7 million civilian noninstitutionalized youths 12-17 years of age in the United States at midsurvey time. The 6,768 youths examined, 90 percent of the sample, were closely representative of the youth population from which they were drawn with respect to age, sex, race, region, and other demographic and socioeconomic variables considered in this report. Comparison is made throughout with findings among U.S. children 6-11 years of age from the 1963-65 Health Examination Survey.

Major findings from this study among youths include:

1. From the otoscopic examination, 15.2 percent, or an estimated 3.4 million youths aged 12-17 years, were found to have some abnormality in at least one eardrum. An

- additional 10.4 percent, or 2.4 million youths, had their auditory canal so occluded, usually by cerumen, that the condition of the drum could not be determined.
2. Abnormalities of the eardrum were found significantly more often among white than Negro youths, but only slightly more frequently among youths from the West than other regions and among those from rural than urban areas. The relationship of these conditions to the socioeconomic status of the family were not consistent; however, the prevalence tended to be slightly higher among those from families where income and parent educational levels were lowest.
 3. Youths with abnormalities of their eardrums had reduced hearing sensitivity, on the average, at all test frequencies; however, even for youths with such abnormalities, mean hearing levels were still generally within the normal range. Specific conditions most closely associated with reduced hearing sensitivity were perforation and decreased mobility of the drum. Also significantly related to reduced sensitivity at some but not all of the test frequencies were findings of discoloration of the drum, bulging or retraction of the drum, and scarring of the drum as well as absence of findings because of complete occlusion of the auditory canal by cerumen and incomplete visibility of the drum.
 4. Significantly enlarged tonsils touching at the midline were found among less than 1 percent (0.2 percent) of the youth population, while nearly two-fifths (38.3 percent) had had their tonsils removed. Tonsils were completely or partially removed (tags remaining) more frequently among white than Negro youths and less frequently among those from the South and those from families with annual incomes of less than \$5,000. Normal and slightly enlarged tonsils were found more often among Negro than white youths and among those from the South than elsewhere.
 5. Histories of previous ear infection and ear injury were reported substantially more frequently among white than Negro youths, whereas trouble hearing was reported significantly less often among white than Negro youths. Trouble hearing was reported more frequently among youths in the South and among those from families where income and parent education were lowest.
 6. The prevalence rates among youths for a history of difficulty or trouble hearing and earaches in the past year were significantly greater on the history as given by the youths themselves than as reported for them by their parents. Among those youths giving such a history, less than half were also reported to have such a problem by their parents.
 7. Youths found on examination to have an abnormal tympanic membrane were substantially more likely than those with normal eardrums to have been reported by their parents to have had difficulty hearing, earaches in the past year, drums opened or lanced, or running ears.

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Table 1. Prevalence rates of parent-reported medical history that may be associated with hearing impairment among youths aged 12-17 years, by age and sex, with standard errors for total rates: United States, 1966-70

Age and sex	Trouble hearing	Earaches in past year	Injury to ears	Drum perforated	Other ear operation	Running ears	Other ear trouble
Both sexes							
Rate per 100 youths							
Total, 12-17 years	3.7	15.1	3.6	3.0	0.9	9.4	3.6
12 years	3.0	19.2	3.2	3.1	0.9	9.7	4.2
13 years	2.9	13.9	3.2	2.9	0.3	9.3	3.6
14 years	4.6	15.5	3.7	3.4	1.5	10.4	3.4
15 years	4.4	16.0	3.4	3.1	0.6	9.8	3.7
16 years	3.1	13.5	3.2	2.4	0.5	8.2	3.9
17 years	4.1	12.1	4.5	3.4	1.6	8.6	2.6
Boys							
Total, 12-17 years	3.7	11.7	3.7	3.2	1.0	9.1	3.4
12 years	3.3	14.5	2.7	2.9	1.0	10.2	4.4
13 years	3.3	11.7	3.9	3.5	0.4	9.2	3.4
14 years	3.8	11.8	3.9	4.2	1.8	10.1	3.0
15 years	4.3	13.6	3.6	3.4	0.7	8.7	3.5
16 years	2.8	8.8	3.2	1.9	0.2	6.4	3.6
17 years	4.5	9.2	5.3	3.4	1.9	10.0	2.3
Girls							
Total, 12-17 years	3.7	18.6	3.4	2.9	0.8	9.6	3.8
12 years	2.6	23.9	3.8	3.3	0.9	9.2	4.0
13 years	2.5	16.2	2.5	2.2	0.1	9.4	3.8
14 years	5.3	19.2	3.5	2.6	1.3	10.7	3.8
15 years	4.5	18.4	3.2	2.9	0.5	10.8	4.0
16 years	3.4	18.3	3.3	2.8	0.8	10.0	4.1
17 years	3.8	15.0	3.8	3.4	1.3	7.2	3.0
Standard error							
Total, 12-17 years	0.28	0.80	0.28	0.35	0.16	0.53	0.22
Boys, 12-17 years	0.31	1.05	0.36	0.52	0.22	0.95	0.28
Girls, 12-17 years	0.42	0.77	0.39	0.33	0.18	0.64	0.43

Table 2. Prevalence rates of parent-reported history of trouble hearing and other ear problems among youths aged 12-17 years, by race, age, and sex, with total standard errors: United States, 1966-70

Medical history item and race	Ages 12-17	Age in years						Boys 12-17 years	Girls 12-17 years	Total 12-17 years	Boys 12-17 years	Girls 12-17 years
		12	13	14	15	16	17					
<u>Trouble hearing</u>		Rate per 100 youths								Standard error in percent		
White	3.5	2.8	2.7	4.2	4.1	2.9	4.3	3.5	3.5	0.32	0.33	0.49
Negro	4.7	3.7	4.3	7.2	5.8	4.6	2.3	4.9	4.5	0.47	0.78	0.72
<u>Earaches</u>												
White	15.3	20.0	14.8	15.2	16.4	13.0	12.0	11.8	18.9	0.84	0.75	1.09
Negro	13.8	13.6	8.5	17.1	13.6	17.1	13.0	10.6	16.8	1.99	2.03	2.46
<u>Running ears</u>												
White	10.0	10.6	10.1	11.1	10.4	8.4	9.2	9.8	10.2	0.62	1.09	0.69
Negro	5.3	4.0	4.4	6.2	5.0	6.6	5.5	5.2	5.4	0.71	1.23	0.83
<u>Ear injury</u>												
White	3.8	3.6	3.4	4.0	3.5	3.5	4.8	3.9	3.7	0.31	0.42	0.43
Negro	1.9	1.3	2.2	1.7	2.7	1.4	2.2	2.3	1.5	0.43	0.58	0.64
<u>Drum opened</u>												
White	3.3	3.5	3.2	3.6	3.6	2.5	3.6	3.5	3.2	0.41	0.58	0.38
Negro	1.2	0.8	0.6	2.4	-	1.6	1.9	1.4	1.1	0.45	0.70	0.42
<u>Other ear operation</u>												
White	1.0	0.7	0.3	1.8	0.7	0.4	1.8	1.0	0.9	0.18	0.24	0.21
Negro	0.6	2.2	-	-	-	0.7	0.5	0.6	0.5	0.38	0.42	0.45
<u>Other ear trouble</u>												
White	3.8	4.4	3.6	3.6	3.9	4.4	3.0	3.5	4.1	0.26	0.28	0.48
Negro	2.0	3.6	3.5	2.1	1.2	0.6	0.6	2.4	1.6	0.49	0.88	0.47

Table 3. Prevalence rates of parent-reported history of trouble hearing and other ear problems among youths aged 12-17 years, by region, age, and sex, with total standard errors: United States, 1966-70

Medical history item and region	Ages 12-17	Age in years						Boys 12-17 years	Girls 12-17 years	Total 12-17 years	Boys 12-17 years	Girls 12-17 years
		12	13	14	15	16	17					
<u>Trouble hearing</u>		Rate per 100 youths									Standard error in percent	
Northeast	2.4	2.1	2.3	2.8	1.9	2.0	3.4	2.4	2.4	0.30	0.58	0.49
Midwest	3.2	3.3	2.7	4.4	4.5	2.2	2.2	2.7	3.8	0.46	0.49	0.82
South	5.6	5.2	5.6	5.5	7.3	3.5	6.6	5.5	5.8	0.56	0.60	0.57
West	3.5	1.5	1.4	5.5	3.6	4.6	4.6	4.2	2.8	0.57	0.49	0.92
<u>Earaches</u>		Rate per 100 youths									Standard error in percent	
Northeast	13.2	20.0	12.7	12.3	12.7	11.3	8.8	9.6	16.9	1.70	1.66	2.06
Midwest	14.6	18.5	14.1	12.3	16.5	12.4	13.5	11.6	17.7	2.30	2.27	2.53
South	16.9	19.6	14.2	20.4	17.6	15.4	13.6	12.8	21.1	1.46	1.82	1.99
West	15.6	18.7	14.6	17.1	16.6	14.6	11.8	12.6	18.8	0.85	1.27	1.28
<u>Running ears</u>		Rate per 100 youths									Standard error in percent	
Northeast	8.5	8.5	7.9	11.9	7.4	9.2	5.6	8.7	8.2	0.97	1.64	1.24
Midwest	11.2	11.6	13.6	8.6	15.2	10.4	7.4	10.9	11.5	1.35	2.67	1.38
South	8.6	11.8	6.7	10.2	7.2	7.9	8.1	8.5	8.8	1.01	1.67	0.83
West	8.6	6.8	7.8	11.2	8.3	5.2	12.9	8.0	9.3	0.97	0.65	1.78
<u>Ear injury</u>		Rate per 100 youths									Standard error in percent	
Northeast	2.8	3.1	2.6	3.4	2.7	2.5	2.5	3.5	2.1	0.45	0.78	0.40
Midwest	3.6	3.2	3.9	3.3	4.6	3.5	2.8	3.0	4.1	0.62	0.80	0.83
South	3.2	3.4	3.6	2.6	3.0	3.1	3.9	3.9	2.5	0.50	0.59	0.60
West	4.5	3.4	2.6	5.5	3.2	3.7	8.8	4.5	4.4	0.70	0.72	1.23
<u>Drum opened</u>		Rate per 100 youths									Standard error in percent	
Northeast	2.8	2.1	2.3	3.0	2.2	3.4	4.2	2.8	2.8	0.62	0.71	0.82
Midwest	2.8	5.0	1.8	3.4	2.4	2.1	2.2	2.7	3.0	0.49	0.66	0.52
South	1.9	2.4	3.4	1.4	1.2	1.3	2.0	2.2	1.7	0.30	0.52	0.18
West	4.5	2.4	4.1	5.6	6.6	3.0	5.4	5.1	3.9	1.22	1.88	0.99
<u>Other ear trouble</u>		Rate per 100 youths									Standard error in percent	
Northeast	3.5	3.7	4.7	4.4	3.3	3.5	0.8	3.4	3.6	0.36	0.55	0.87
Midwest	3.9	4.5	2.3	3.1	4.1	6.1	3.3	3.3	4.5	0.32	0.20	0.69
South	3.5	5.6	3.4	2.9	2.5	2.8	4.2	2.9	4.2	0.42	0.46	0.64
West	3.4	3.2	4.3	3.2	4.9	2.7	2.1	4.0	2.8	0.45	0.89	0.63

Table 4. Prevalence rates of parent-reported history of trouble hearing and other ear problems among youths aged 12-17 years, by urban and rural area of residence, age, and sex, with total standard errors: United States, 1966-70

Medical history item and area of residence	Ages 12-17	Age in years						Boys 12-17 years	Girls 12-17 years	Total 12-17 years	Boys 12-17 years	Girls 12-17 years
		12	13	14	15	16	17					
<u>Trouble hearing</u>		Rate per 100 youths									Standard error in percent	
Urban	3.4	2.7	2.7	4.7	4.4	2.3	4.0	3.7	3.2	0.30	0.41	0.42
Rural	4.1	3.5	3.4	4.4	4.4	4.4	4.4	3.6	4.6	0.53	0.65	0.70
<u>Earaches</u>		Rate per 100 youths									Standard error in percent	
Urban	14.7	18.4	15.4	13.7	16.1	13.2	11.0	11.0	18.4	1.01	0.95	1.37
Rural	15.8	20.5	11.4	18.5	15.7	14.0	14.0	12.9	18.8	1.00	0.98	1.28
<u>Running ears</u>		Rate per 100 youths									Standard error in percent	
Urban	8.4	8.6	8.7	7.4	9.0	8.2	8.5	7.8	9.0	0.48	0.81	0.85
Rural	11.0	11.6	10.3	15.5	11.1	8.0	8.9	11.3	10.6	0.99	1.69	0.86

Table 5. Prevalence rates of parent-reported history of trouble hearing and other ear problems among youths aged 12-17 years, by income, age, and sex, with total standard errors: United States, 1966-70

Medical history item and income	Ages 12-17	Age in years						Boys 12-17 years	Girls 12-17 years	Total 12-17 years	Boys 12-17 years	Girls 12-17 years
		12	13	14	15	16	17					
<u>Trouble hearing</u>		Rate per 100 youths									Standard error in percent	
Less than \$3,000	6.7	7.1	5.8	7.2	7.9	5.3	7.0	6.4	7.0	0.55	1.03	1.10
\$3,000-\$4,999	3.9	2.9	2.1	4.9	2.8	2.7	8.7	3.2	4.7	0.83	0.72	1.41
\$5,000-\$6,999	3.5	2.9	3.8	5.1	4.4	2.6	2.0	4.3	2.8	0.58	0.95	0.80
\$7,000-\$9,999	3.7	4.4	2.7	2.6	5.4	3.2	3.8	4.2	3.1	0.65	0.74	0.74
\$10,000-\$14,999	2.3	0.6	2.1	5.0	1.5	1.7	3.1	1.8	2.9	0.54	0.53	1.06
\$15,000 or more	1.4	0.6	-	1.8	1.3	2.4	2.3	1.1	1.8	0.42	0.52	0.65
<u>Earaches</u>		Rate per 100 youths									Standard error in percent	
Less than \$3,000	18.9	26.2	17.6	22.0	17.3	15.6	15.0	15.4	22.0	1.75	1.59	2.81
\$3,000-\$4,999	16.2	17.8	11.8	18.6	15.7	17.1	16.4	12.4	20.1	1.49	1.65	1.62
\$5,000-\$6,999	14.4	17.5	9.3	16.3	18.5	15.2	9.2	11.1	17.5	1.20	1.58	2.17
\$7,000-\$9,999	16.6	23.2	17.9	16.4	17.5	10.8	11.2	12.8	20.9	1.04	0.95	1.69
\$10,000-\$14,999	13.4	16.3	14.3	11.0	13.9	15.7	9.1	10.6	16.1	1.51	1.39	1.99
\$15,000 or more	11.8	14.5	11.5	14.9	8.0	9.4	12.4	9.0	14.9	2.31	2.45	2.73
<u>Running ears</u>		Rate per 100 youths									Standard error in percent	
Less than \$3,000	10.6	9.4	7.1	13.8	14.0	9.6	9.9	9.3	11.8	1.49	1.38	2.10
\$3,000-\$4,999	9.4	12.4	7.3	13.0	6.2	6.7	9.8	8.1	10.6	1.25	1.37	1.70
\$5,000-\$6,999	8.8	8.0	8.8	9.3	13.5	7.6	5.6	9.1	8.6	0.95	1.28	1.21
\$7,000-\$9,999	9.8	10.8	12.3	9.2	9.0	7.4	9.4	10.4	9.0	1.11	1.69	1.17
\$10,000-\$14,999	8.5	10.7	7.1	8.5	8.3	8.3	8.0	7.1	9.9	0.90	1.65	2.14
\$15,000 or more	8.8	7.8	12.7	8.2	8.9	6.6	8.5	9.7	7.7	1.29	1.66	1.79

Table 6. Prevalence rates of parent-reported history of trouble hearing and other ear problems among youths aged 12-17 years, by education of parent, age, and sex, with total standard errors: United States, 1966-70

Medical history item and education of parent	Ages 12-17	Age in years						Boys 12-17 years	Girls 12-17 years	Total 12-17 years	Boys 12-17 years	Girls 12-17 years
		12	13	14	15	16	17					
<u>Trouble hearing</u>		Rate per 100 youths									Standard error in percent	
Less than 5 years	7.2	9.6	5.1	6.6	10.6	2.7	9.2	7.2	7.2	1.74	1.65	2.50
5-11 years	4.1	3.9	3.1	5.4	4.6	4.0	3.9	3.9	4.4	0.46	0.65	0.59
12 years or more	2.9	1.4	2.6	3.9	3.6	2.5	3.5	3.1	2.7	0.39	0.39	0.59
<u>Earaches</u>		Rate per 100 youths									Standard error in percent	
Less than 5 years	18.3	18.0	14.9	18.6	22.4	13.7	23.6	17.3	19.2	3.74	3.23	4.90
5-11 years	15.7	20.1	14.2	18.8	16.7	12.8	11.3	10.7	20.8	0.70	0.72	1.09
12 years or more	14.0	18.6	13.6	13.1	14.3	13.8	10.1	11.9	16.4	1.15	1.19	1.44
<u>Running ears</u>		Rate per 100 youths									Standard error in percent	
Less than 5 years	9.6	11.0	6.4	14.8	4.6	4.3	17.2	8.4	10.7	1.71	1.46	3.08
5-11 years	9.1	8.4	8.6	10.6	9.9	10.0	7.2	8.6	9.6	0.77	1.09	0.81
12 years or more	9.7	10.8	10.4	10.0	10.2	7.8	8.6	9.8	9.6	0.78	1.36	1.11

Table 7. Prevalence rates of youth-reported medical history that may be associated with hearing impairment among youths aged 12-17 years, by age and sex, with standard errors for total rates: United States, 1966-70

Age and sex	Trouble hearing	Earaches	Injury to ears	Other ear troubles
<u>Both sexes</u>				
Rate per 100 youths				
Total, 12-17 years	4.9	20.4	4.7	8.0
12 years	3.7	23.8	4.6	7.6
13 years	4.4	22.2	4.7	6.2
14 years	5.9	20.8	5.4	7.6
15 years	5.4	20.3	4.3	8.5
16 years	4.9	18.7	4.4	9.2
17 years	5.5	16.2	4.6	8.9
<u>Boys</u>				
Total, 12-17 years	4.9	17.6	4.8	8.3
12 years	4.2	20.5	4.9	8.4
13 years	4.3	21.6	4.8	6.3
14 years	6.1	19.4	4.9	9.1
15 years	4.9	16.9	4.8	7.8
16 years	4.4	14.6	4.4	8.1
17 years	5.7	11.6	5.0	10.4
<u>Girls</u>				
Total, 12-17 years	5.0	23.3	4.5	7.6
12 years	3.2	27.2	4.3	6.8
13 years	4.6	22.7	4.6	6.0
14 years	5.7	22.2	5.9	6.0
15 years	5.8	23.9	3.8	9.3
16 years	5.5	22.9	4.4	10.4
17 years	5.3	20.8	4.2	7.4
<u>Standard error</u>				
Total, 12-17 years	0.23	0.56	0.32	0.50
Boys, 12-17 years	0.36	0.69	0.44	0.58
Girls, 12-17 years	0.38	0.78	0.41	0.63

Table 8. Prevalence rates of parent-reported and youth-reported history of trouble hearing and ear problems among youths aged 12-17 years: United States, 1966-70

History of abnormality— parents' report	Total prevalence rate (parents' report)	History of abnormality—youths' report								Standard error for abnormal findings (parents' report)
		Trouble hearing		Earaches in past year		Injury to ear		Other ear trouble		
		Yes	No	Yes	No	Yes	No	Yes	No	
Rate per 100 youths										
Total prevalence rate (youths' report) ,		4.9	95.1	20.4	79.6	4.7	95.3	8.0	92.0	
<u>Hearing trouble</u>										
Yes	3.7	46.1	1.5	8.1	2.5	22.6	2.5	13.9	2.8	0.28
No	96.3	53.9	98.5	91.9	97.5	77.4	97.5	86.1	97.2	
<u>Earaches in past year</u>										
Yes	15.1	33.1	14.1	44.8	7.4	29.2	14.3	31.2	13.7	0.80
No	84.9	66.9	85.9	55.2	92.6	70.8	85.7	68.8	86.3	
<u>Injury to ear</u>										
Yes	3.6	20.6	2.6	5.9	2.9	45.9	1.3	11.4	2.8	0.28
No	96.4	79.4	97.4	94.1	97.1	54.1	98.7	88.6	97.2	
<u>Drum opened</u>										
Yes	3.0	12.2	2.6	5.1	2.5	22.0	2.1	15.2	2.0	0.35
No	97.0	87.8	97.4	94.9	97.5	78.0	97.9	84.8	98.0	
<u>Other ear operation</u>										
Yes	0.9	3.9	0.8	1.2	0.8	6.2	0.6	6.1	0.5	0.16
No	99.1	96.1	99.2	98.8	99.2	93.8	99.4	93.9	99.5	
<u>Running ears</u>										
Yes	9.4	32.7	8.1	17.3	7.3	39.1	7.5	33.9	7.2	0.53
No	90.6	67.3	91.9	82.7	92.7	60.9	92.5	66.1	92.8	
<u>Other ear trouble</u>										
Yes	3.6	9.9	3.3	7.3	2.6	11.1	3.3	18.1	2.3	0.22
No	96.4	90.1	96.7	92.7	97.4	88.9	96.7	81.9	97.7	
Standard error for abnormal findings (youths' report)		0.23		0.56		0.32		0.50		

Table 9. Prevalence rates of youth-reported history of trouble hearing and other ear problems among youths aged 12-17 years, by race, age, and sex, with total standard errors: United States, 1966-70

Medical history item and race	Ages 12-17	Age in years						Boys 12-17 years	Girls 12-17 years	Total 12-17 years	Boys 12-17 years	Girls 12-17 years
		12	13	14	15	16	17					
<u>Trouble hearing</u>		Rate per 100 youths								Standard error in percent		
White	4.8	3.9	4.3	5.3	4.5	5.3	5.7	4.8	4.8	0.25	0.38	0.43
Negro	5.5	2.5	5.5	9.0	10.0	1.8	4.3	5.5	5.4	0.43	0.78	0.75
<u>Earaches</u>												
White	20.6	25.1	22.1	20.6	20.4	18.9	16.0	17.8	23.6	0.61	0.74	0.86
Negro	19.5	15.7	22.7	21.8	21.3	18.0	17.5	16.8	22.2	0.98	1.21	1.75
<u>Ear injury</u>												
White	4.8	4.7	4.6	5.8	4.5	4.5	4.6	4.9	4.7	0.37	0.50	0.48
Negro	3.7	4.2	5.4	2.7	2.7	3.8	3.1	3.5	3.8	0.61	0.42	1.07
<u>Other ear trouble</u>												
White	8.6	8.2	7.0	7.9	8.9	10.3	9.7	9.0	8.3	0.57	0.65	0.73
Negro	3.8	4.2	1.2	5.6	5.3	2.4	4.3	4.5	3.2	0.59	1.00	0.91

Table 10. Prevalence rates of ear, nose, and throat abnormalities found on examination among youths aged 12-17 years, by age and sex, with standard errors for total rates: United States, 1966-70

Age and sex	Abnormalities of external ear		Abnormalities of auditory canal		Drum—any abnormality		Drum dull (opaque)		Drum transparent	
	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
Both sexes										
Rate per 100 youths										
Total, 12-17 years	0.8	0.9	11.6	11.7	11.2	11.1	4.3	4.4	0.4	0.5
12 years	0.8	0.8	12.8	13.4	11.1	11.3	4.2	4.3	0.5	0.7
13 years	0.9	0.8	11.7	11.6	10.0	9.7	3.7	3.5	0.2	0.2
14 years	0.9	1.0	10.5	10.9	12.0	11.2	4.9	5.4	0.3	0.7
15 years	1.0	1.2	12.5	12.8	12.0	12.3	5.2	5.2	0.2	0.4
16 years	0.4	1.0	11.8	10.4	10.5	10.8	3.9	3.9	0.4	0.3
17 years	0.6	0.6	9.7	10.7	11.8	11.5	3.8	4.1	0.7	0.4
Boys										
Total, 12-17 years	0.6	0.7	11.3	11.6	11.5	10.8	4.4	4.3	0.5	0.5
12 years	0.6	0.6	10.6	10.3	11.7	11.7	4.5	5.0	0.7	0.7
13 years	0.5	0.3	11.4	11.3	11.2	9.2	4.4	3.6	0.3	0.3
14 years	1.0	1.1	11.6	12.8	12.0	10.8	4.0	4.9	0.6	0.8
15 years	0.4	1.0	12.2	13.2	11.8	11.8	5.1	4.4	0.3	0.5
16 years	0.1	0.5	12.0	10.8	10.7	10.1	3.9	4.3	0.2	0.2
17 years	0.7	0.5	10.2	11.4	11.6	11.8	4.4	3.4	0.7	0.4
Girls										
Total, 12-17 years	1.0	1.1	11.8	11.7	10.9	11.4	4.2	4.5	0.3	0.4
12 years	1.0	1.0	15.2	16.6	10.5	10.9	3.9	3.6	0.4	0.6
13 years	1.2	1.4	12.0	12.0	8.8	10.2	2.9	3.3	-	0.2
14 years	0.8	0.8	9.4	9.0	12.0	11.6	5.9	5.8	-	0.6
15 years	1.6	1.3	12.9	12.4	12.1	12.9	5.4	6.0	0.2	0.2
16 years	0.6	1.5	11.5	10.0	10.3	11.6	3.8	3.6	0.5	0.5
17 years	0.4	0.8	9.2	10.0	12.0	11.3	3.3	4.9	0.7	0.5
Standard error										
Total, 12-17 years	0.13	0.13	0.66	0.64	1.66	1.56	0.81	0.80	0.28	0.32
Boys, 12-17 years	0.16	0.16	0.78	0.61	1.79	1.52	0.88	0.87	0.33	0.32
Girls, 12-17 years	0.17	0.23	0.77	0.92	1.63	1.73	0.82	0.81	0.24	0.34

Table 10. Prevalence rates of ear, nose, and throat abnormalities found on examination among youths aged 12-17 years, by age and sex, with standard errors for total rates: United States, 1966-70—Con.

Age and sex	Drum bulging or retracted		Drum perforated		Drum discolored		Drum scars	
	Right	Left	Right	Left	Right	Left	Right	Left
<u>Both sexes</u>								
Rate per 100 youths								
Total, 12-17 years	2.4	2.5	0.8	0.8	1.0	0.8	3.5	3.3
12 years	1.6	1.9	0.6	0.9	1.2	1.2	3.2	3.2
13 years	2.5	2.0	0.6	0.7	1.2	0.5	2.7	2.8
14 years	3.2	3.0	1.0	1.0	1.2	0.8	4.1	3.1
15 years	2.6	3.1	0.5	0.4	0.5	0.6	3.7	4.1
16 years	1.8	2.9	0.6	0.6	0.9	0.7	3.9	2.9
17 years	2.4	2.1	1.2	1.0	0.8	0.7	3.7	3.9
<u>Boys</u>								
Total, 12-17 years	2.4	2.3	0.7	0.8	1.2	1.0	3.9	3.4
12 years	1.7	2.1	0.5	1.2	1.5	2.0	2.9	2.6
13 years	2.3	1.7	0.6	0.5	1.4	0.8	3.4	2.4
14 years	3.4	2.6	0.8	0.4	1.4	0.7	4.5	3.3
15 years	2.6	2.6	0.6	0.4	0.3	0.5	4.2	4.7
16 years	2.2	2.7	1.0	0.9	1.4	1.1	4.2	3.3
17 years	2.0	1.8	0.9	1.2	1.2	0.9	4.3	4.2
<u>Girls</u>								
Total, 12-17 years	2.4	2.7	0.8	0.8	0.7	0.5	3.1	3.2
12 years	1.6	1.8	0.7	0.6	0.8	0.4	3.4	3.8
13 years	2.8	2.4	0.6	0.9	1.0	0.2	1.9	3.2
14 years	3.0	3.3	1.3	1.5	1.0	0.9	3.7	2.8
15 years	2.6	3.6	0.4	0.4	0.8	0.8	3.2	3.5
16 years	1.5	3.1	0.2	0.4	0.4	0.4	3.5	2.5
17 years	2.9	2.4	1.5	0.8	0.4	0.6	3.1	3.6
<u>Standard error</u>								
Total, 12-17 years	0.58	0.53	0.16	0.17	0.28	0.17	1.29	1.26
Boys, 12-17 years	0.53	0.49	0.20	0.17	0.40	0.31	1.44	1.22
Girls, 12-17 years	0.68	0.68	0.17	0.23	0.23	0.15	1.18	1.33

Table 10. Prevalence rates of ear, nose, and throat abnormalities found on examination among youths aged 12-17 years, by age and sex, with standard errors for total rates: United States, 1966-70—Con.

Age and sex	Fluid on drum		Calcium plaques		Tonsils				
	Right	Left	Right	Left	Not visible	Tags	Grade I	Grade II	Grade III
<u>Both sexes</u>									
Rate per 100 youths									
Total, 12-17 years	0.2	0.3	1.8	1.9	28.4	9.9	33.6	27.9	0.2
12 years	0.2	0.3	1.8	2.2	26.2	8.2	32.2	33.3	0.1
13 years	0.1	0.4	1.7	1.7	24.9	10.2	32.9	31.6	0.4
14 years	0.5	0.4	1.7	2.0	27.3	9.1	33.6	29.9	0.1
15 years	0.2	0.3	1.9	1.8	30.5	11.4	32.0	25.8	0.3
16 years	0.2	0.2	1.7	2.0	30.1	12.0	35.9	22.0	-
17 years	0.2	0.2	2.0	1.8	32.2	8.7	35.2	23.9	-
<u>Boys</u>									
Total, 12-17 years	0.3	0.4	1.9	1.7	28.5	10.6	32.8	28.0	0.1
12 years	0.2	0.6	1.7	1.9	26.8	10.1	30.9	32.1	0.1
13 years	0.1	0.8	2.1	1.7	26.9	10.2	30.2	32.6	0.1
14 years	0.7	0.2	1.8	1.8	29.1	10.3	31.7	28.9	-
15 years	-	0.2	2.3	1.7	31.0	12.0	31.0	25.8	0.2
16 years	0.2	0.4	1.8	1.5	26.2	12.5	38.3	23.0	-
17 years	0.4	0.2	1.6	1.7	31.6	8.2	35.6	24.6	-
<u>Girls</u>									
Total, 12-17 years	0.2	0.2	1.7	2.1	28.3	9.2	34.4	27.9	0.2
12 years	0.2	-	2.0	2.5	25.6	6.2	33.5	34.5	0.2
13 years	-	-	1.2	1.7	22.9	10.2	35.8	30.5	0.6
14 years	0.3	0.6	1.6	2.2	25.5	7.8	35.5	31.0	0.2
15 years	0.4	0.4	1.4	1.8	30.0	10.8	33.2	25.7	0.3
16 years	0.1	-	1.6	2.6	34.1	11.5	33.5	20.9	-
17 years	-	0.2	2.3	1.9	32.8	9.2	34.7	23.3	-
<u>Standard error</u>									
Total, 12-17 years	0.08	0.12	0.36	0.34	1.88	1.24	2.54	2.18	0.07
Boys, 12-17 years	0.12	0.17	0.35	0.30	1.87	1.47	2.31	2.51	0.05
Girls, 12-17 years	0.08	0.14	0.44	0.52	2.05	1.07	2.88	2.07	0.11

Table 10. Prevalence rates of ear, nose, and throat abnormalities found on examination among youths aged 12-17 years, by age and sex, with standard errors for total rates: United States, 1966-70—Con.

Age and sex	Abnormality of oral pharynx	Abnormality of nose		Right ear occluded			Left ear occluded		
		Right	Left	Total	Partly	Completely	Total	Partly	Completely
Both sexes									
Rate per 100 youths									
Total, 12-17 years	6.6	8.0	8.0	11.2	5.1	6.2	11.4	5.6	5.8
12 years	6.2	7.8	7.5	12.7	5.8	6.9	13.1	7.1	5.9
13 years	7.6	8.0	7.9	11.5	5.6	5.9	11.4	5.6	5.8
14 years	5.4	8.3	7.7	9.8	4.4	5.4	10.6	5.2	5.4
15 years	6.4	7.7	8.2	12.3	6.0	6.3	12.6	5.9	6.8
16 years	6.5	8.0	8.6	11.4	5.0	6.4	10.1	5.0	5.0
17 years	7.7	8.3	8.2	9.5	3.6	6.0	10.4	4.4	6.0
Boys									
Total, 12-17 years	7.1	9.6	9.4	10.9	4.5	6.4	11.2	4.9	6.3
12 years	5.8	8.2	8.5	10.4	3.9	6.5	10.0	4.1	5.9
13 years	7.0	8.8	8.2	11.1	5.4	5.7	11.0	5.0	5.9
14 years	5.5	10.3	8.4	10.9	3.8	7.1	12.4	6.6	5.8
15 years	6.3	9.5	10.5	11.7	5.8	5.9	13.0	5.4	7.7
16 years	9.4	10.6	11.4	11.2	4.7	6.5	10.1	3.7	6.4
17 years	8.6	10.1	10.0	10.1	3.5	6.5	10.7	4.4	6.2
Girls									
Total, 12-17 years	6.2	6.4	6.6	11.6	5.6	5.9	11.6	6.3	5.3
12 years	6.7	7.3	6.4	15.1	7.8	7.3	16.3	10.3	6.0
13 years	8.2	7.2	7.7	11.8	5.7	6.1	11.8	6.2	5.6
14 years	5.3	6.3	7.0	8.7	5.1	3.7	8.7	3.7	5.0
15 years	6.5	5.9	5.9	12.9	6.1	6.8	12.2	6.4	5.8
16 years	3.4	5.4	5.8	11.5	5.2	6.3	10.0	6.4	3.6
17 years	6.7	6.5	6.4	9.0	3.6	5.4	10.0	4.3	5.7
Standard error									
Total, 12-17 years	1.14	1.16	1.24	0.63	0.51	0.58	0.62	0.58	0.57
Boys, 12-17 years	1.15	1.39	1.39	0.74	0.49	0.78	0.60	0.54	0.44
Girls, 12-17 years	1.17	1.02	1.19	0.77	0.62	0.55	0.91	0.79	0.82

Table 11. Prevalence rates of abnormal conditions found on examination of the right eardrum among youths aged 12-17 years, by race, age, and sex, with total standard errors: United States, 1966-70

Condition of right drum and race	Ages 12-17	Age in years						Boys 12-17 years	Girls 12-17 years	Total 12-17 years	Boys 12-17 years	Girls 12-17 years
		12	13	14	15	16	17					
<u>Abnormal</u>		Rate per 100 youths								Standard error in percent		
White	11.9	11.8	10.6	12.8	12.6	11.2	12.3	12.2	11.5	1.79	1.97	1.70
Negro	6.5	6.3	6.2	7.0	6.8	5.6	7.3	5.7	7.3	2.00	2.06	2.30
<u>Bulging or retracted</u>												
White	2.5	1.8	2.7	3.5	2.4	1.8	2.6	2.5	2.4	0.59	0.56	0.68
Negro	1.6	0.7	1.2	1.2	3.2	2.3	1.5	1.2	2.0	1.08	0.73	1.49
<u>Not mobile</u>												
White	1.9	1.7	1.9	2.1	2.2	2.0	1.4	2.0	1.7	0.35	0.35	0.47
Negro	2.2	1.2	-	3.6	1.6	2.8	4.0	2.5	1.8	0.80	0.85	0.94
<u>Completely occluded</u>												
White	5.7	6.7	5.4	5.1	5.3	5.6	5.8	5.6	5.8	0.59	0.77	0.62
Negro	8.9	8.7	7.6	7.3	11.3	11.5	7.3	11.2	6.6	1.37	1.92	1.15

Table 12. Prevalence rates of abnormal conditions found on examination of the right eardrum among youths aged 12-17 years, by region, age, and sex, with total standard errors: United States, 1966-70

Condition of right drum and region	Ages 12-17	Age in years						Boys 12-17 years	Girls 12-17 years	Total 12-17 years	Boys 12-17 years	Girls 12-17 years
		12	13	14	15	16	17					
<u>Abnormal</u>		Rate per 100 youths								Standard error in percent		
Northeast	10.0	9.7	11.9	11.3	7.6	8.9	10.4	10.8	9.3	1.03	1.51	1.06
Midwest	7.8	8.2	6.6	8.6	9.6	6.7	6.9	7.5	8.0	2.17	2.11	2.35
South	9.8	10.5	6.8	11.0	12.3	5.7	12.2	10.1	9.6	2.98	2.80	3.25
West	17.3	16.2	15.2	17.1	17.7	20.0	17.8	17.8	16.9	5.51	6.39	4.73
<u>Bulging or retracted</u>												
Northeast	0.9	0.4	0.6	1.4	0.4	1.4	1.3	1.0	0.8	0.49	0.49	0.54
Midwest	2.1	0.9	2.1	3.0	2.3	1.3	3.2	2.4	1.8	0.50	0.70	0.54
South	2.7	1.4	2.6	4.1	4.1	1.8	2.2	2.3	3.2	1.79	1.44	2.16
West	3.6	3.9	4.8	4.1	3.1	2.9	2.8	3.6	3.6	1.31	1.32	1.47
<u>Not mobile</u>												
Northeast	0.5	0.3	1.0	1.2	-	-	-	0.8	0.2	0.21	0.41	0.15
Midwest	2.2	0.4	3.0	1.5	3.2	2.9	2.3	2.8	1.5	0.74	0.76	0.99
South	2.9	4.5	2.4	3.8	2.3	2.9	1.6	2.8	3.1	1.18	1.11	1.29
West	2.0	1.7	-	2.7	2.6	2.0	2.6	1.7	2.2	0.39	0.54	0.65
<u>Completely occluded</u>												
Northeast	5.9	5.6	4.8	5.5	8.7	6.4	4.8	6.1	5.7	0.53	0.98	0.48
Midwest	7.0	8.2	4.6	7.0	7.1	6.8	8.4	7.5	6.4	1.90	2.25	1.84
South	5.9	6.6	7.6	5.6	4.1	6.3	5.0	6.3	5.4	0.80	1.24	0.71
West	5.7	6.9	6.9	3.5	5.8	6.0	5.0	5.4	6.0	1.14	1.49	1.14

Table 13. Prevalence rates of abnormal conditions found on examination of the right eardrum among youths aged 12-17 years, by urban and rural place of residence, age, and sex, with total standard errors: United States, 1966-70

Condition of right drum and area of residence	Ages 12-17	Age in years						Boys 12-17 years	Girls 12-17 years	Total 12-17 years	Boys 12-17 years	Girls 12-17 years	
		12	13	14	15	16	17						
<u>Abnormal</u>		Rate per 100 youths									Standard error in percent		
Urban	9.8	9.2	10.0	9.4	9.8	9.0	11.4	9.9	9.7	1.34	1.46	1.39	
Rural	13.8	14.6	9.9	16.5	15.6	13.0	12.6	14.3	13.2	2.78	3.19	2.47	
<u>Bulging or retracted</u>													
Urban	2.0	1.8	2.7	2.2	1.4	1.6	2.3	1.9	2.2	0.53	0.46	0.69	
Rural	3.0	1.4	2.2	4.8	4.6	2.2	2.7	3.2	2.8	1.08	1.00	1.25	
<u>Not mobile</u>													
Urban	1.7	1.1	1.9	2.3	1.3	1.6	2.2	2.0	1.5	0.39	0.38	0.53	
Rural	2.2	2.5	1.3	2.2	3.6	2.8	0.8	2.2	2.2	0.65	0.82	0.62	
<u>Completely occluded</u>													
Urban	5.8	6.3	5.2	4.7	6.7	6.4	5.7	6.1	5.6	0.46	0.70	0.62	
Rural	6.7	7.9	7.2	6.7	5.7	6.4	6.3	6.9	6.5	1.01	1.32	0.97	

Table 14. Prevalence rates of abnormal conditions found on examination of the right eardrum among youths aged 12-17 years, by family income, age, and sex, with total standard errors: United States, 1966-70

Condition of right drum and annual family income	Ages 12-17	Age in years						Boys 12-17 years	Girls 12-17 years	Total 12-17 years	Boys 12-17 years	Girls 12-17 years
		12	13	14	15	16	17					
<u>Abnormal</u>		Rate per 100 youths								Standard error in percent		
Less than \$3,000	14.7	15.5	14.0	10.9	20.4	12.3	14.1	15.9	13.7	4.00	4.70	3.54
\$3,000-\$4,999	13.4	11.2	9.5	15.5	14.8	13.6	17.1	13.9	13.0	3.00	3.72	2.85
\$5,000-\$6,999	9.3	7.4	6.0	9.6	13.0	13.2	7.5	10.0	8.6	1.59	1.93	1.49
\$7,000-\$9,999	10.1	10.2	10.7	10.9	7.2	10.0	11.6	10.3	9.8	1.44	1.64	1.78
\$10,000-\$14,999	10.0	10.6	9.1	12.6	10.4	7.4	9.8	10.3	9.8	1.75	1.61	2.30
\$15,000 or more	10.9	15.2	9.3	8.1	8.9	10.9	12.5	9.8	12.0	2.36	2.20	3.13
<u>Bulging or retracted</u>												
Less than \$3,000	4.1	0.8	5.4	3.3	5.9	2.9	5.7	4.5	3.7	2.23	2.46	2.22
\$3,000-\$4,999	3.0	4.1	1.6	5.4	2.7	1.5	1.8	2.5	3.4	1.31	0.89	1.97
\$5,000-\$6,999	1.9	0.6	1.1	3.4	2.0	3.7	0.6	2.4	1.5	0.64	0.74	0.67
\$7,000-\$9,999	2.3	1.8	3.7	1.5	1.6	1.9	3.2	2.0	2.6	0.73	0.59	1.24
\$10,000-\$14,999	1.6	0.7	1.3	2.9	2.5	0.9	1.2	2.4	0.9	0.37	0.62	0.42
\$15,000 or more	2.4	2.7	0.7	5.8	0.7	0.8	3.4	1.5	3.3	0.87	0.97	1.15
<u>Not mobile</u>												
Less than \$3,000	3.9	4.5	3.6	4.7	5.0	3.2	2.2	4.2	3.6	1.52	1.52	1.65
\$3,000-\$4,999	2.6	3.9	0.6	3.0	1.5	3.6	2.8	2.4	2.7	0.64	0.68	0.98
\$5,000-\$6,999	1.4	0.6	0.5	3.3	0.7	2.4	0.7	1.6	1.3	0.42	0.59	0.65
\$7,000-\$9,999	1.6	1.0	2.3	1.0	2.2	2.1	0.9	1.9	1.2	0.43	0.46	0.62
\$10,000-\$14,999	1.2	-	1.9	1.1	2.1	1.3	1.0	1.4	1.1	0.36	0.64	0.52
\$15,000 or more	1.4	-	0.7	1.4	0.8	1.2	4.2	1.4	1.5	0.63	0.45	1.06
<u>Completely occluded</u>												
Less than \$3,000	6.7	8.0	5.6	10.5	6.5	6.1	3.8	7.0	6.5	0.70	1.07	0.67
\$3,000-\$4,999	7.0	5.4	6.6	6.1	10.1	8.2	6.4	7.8	6.3	1.33	1.76	1.31
\$5,000-\$6,999	7.6	11.9	6.7	6.6	8.6	9.0	2.9	7.4	7.8	1.35	1.70	1.38
\$7,000-\$9,999	5.1	5.9	3.6	3.5	7.0	4.5	6.3	4.9	5.4	1.03	0.96	1.21
\$10,000-\$14,999	6.3	7.0	7.6	5.1	4.8	5.6	7.8	6.7	5.9	1.06	1.37	1.35
\$15,000 or more	3.6	2.6	4.0	1.6	2.6	6.7	4.1	4.4	2.8	0.38	0.72	0.54

Table 15. Prevalence rates of abnormal conditions found on examination of the right eardrum among youths aged 12-17 years, by years of schooling completed by parent, age, and sex, with total standard errors: United States, 1966-70

Condition of right eardrum and education of parent	Ages 12-17	Age in years						Boys 12-17 years	Girls 12-17 years	Total 12-17 years	Boys 12-17 years	Girls 12-17 years	
		12	13	14	15	16	17						
<u>Abnormal</u>		Rate per 100 youths									Standard error in percent		
Less than 5 years	17.9	24.2	12.6	20.5	16.5	12.2	21.8	19.8	16.1	5.11	6.43	4.04	
5-11 years	10.8	6.8	9.2	12.5	12.1	12.3	11.9	11.0	10.6	1.63	2.02	1.58	
12 years or more	10.5	12.3	10.1	10.8	10.3	9.3	10.2	10.6	10.4	1.52	1.43	1.75	
<u>Bulging or retracted</u>													
Less than 5 years	4.4	6.1	-	7.6	4.2	2.6	5.9	5.3	3.4	2.00	2.88	1.54	
5-11 years	2.5	1.0	2.3	3.3	3.3	2.3	2.6	2.2	2.8	0.77	0.59	1.04	
12 years or more	2.0	1.5	2.9	2.5	1.4	1.4	2.0	2.2	1.8	0.52	0.54	0.59	
<u>Not mobile</u>													
Less than 5 years	3.1	9.0	1.3	2.6	1.3	1.2	2.9	3.4	2.8	1.33	2.00	1.66	
5-11 years	2.0	1.4	1.6	3.0	2.2	2.6	1.0	1.9	2.0	0.47	0.44	0.69	
12 years or more	1.6	0.7	1.8	1.6	2.1	1.8	1.9	2.0	1.3	0.38	0.42	0.50	
<u>Completely occluded</u>													
Less than 5 years	8.5	9.6	13.5	8.7	4.6	8.0	4.7	8.6	8.3	1.99	2.44	2.75	
5-11 years	7.4	8.5	6.3	5.8	7.9	6.6	9.1	7.7	7.0	0.71	0.94	0.87	
12 years or more	4.8	5.6	4.3	4.7	4.8	6.1	3.2	4.9	4.7	0.65	0.78	0.69	

Table 16. Prevalence rates of findings from examination of the tonsils and oral pharynx among youths aged 12-17 years, by race, age, and sex, with total standard errors: United States, 1966-70

Examination findings and race	Ages 12-17	Age in years						Boys 12-17 years	Girls 12-17 years	Total 12-17 years	Boys 12-17 years	Girls 12-17 years
		12	13	14	15	16	17					
TONSILS												
Not visible												
Rate per 100 youths											Standard error in percent	
White	31.6	29.3	28.1	30.7	33.6	33.4	35.0	31.6	31.5	2.21	2.21	2.41
Negro	8.0	7.2	5.6	6.5	7.9	8.8	12.9	7.5	8.5	1.04	1.33	1.60
Tags												
White	10.2	8.2	10.6	9.9	11.9	11.9	9.1	10.9	9.6	1.26	1.47	1.14
Negro	7.9	7.8	7.9	4.1	8.4	13.4	6.4	8.7	7.2	1.57	2.11	1.36
Grade I												
White	32.6	31.4	31.8	32.0	31.2	35.0	34.9	31.6	33.8	2.74	2.48	3.11
Negro	39.2	36.5	39.5	42.7	38.4	41.3	36.7	40.6	37.8	5.05	5.20	5.21
Grade II												
White	25.4	30.8	29.3	27.4	23.3	19.8	21.0	25.8	25.1	2.30	2.67	2.17
Negro	44.2	48.5	45.5	46.0	43.8	36.5	44.0	43.1	45.3	4.69	5.57	4.80
Grade III												
White	0.1	0.2	0.2	-	0.1	-	-	0.1	0.1	0.04	0.06	0.05
Negro	0.6	-	1.5	0.6	1.4	-	-	-	1.2	0.36	-	0.72
ORAL PHARYNX												
Abnormality												
White	6.8	6.6	7.2	5.8	7.1	6.2	8.0	7.3	6.3	1.26	1.27	1.34
Negro	5.6	4.3	10.1	3.2	2.5	7.7	5.5	5.6	5.5	1.34	1.92	1.60

Table 17. Prevalence rates of findings from examination of the tonsils and oral pharynx among youths aged 12-17 years, by region, age, and sex, with total standard errors: United States, 1966-70

Examination findings and region	Ages 12-17	Age in years						Boys 12-17 years	Girls 12-17 years	Total 12-17 years	Boys 12-17 years	Girls 12-17 years
		12	13	14	15	16	17					
TONSILS												
<u>Not visible</u>												
Rate per 100 youths										Standard error in percent		
Northeast	34.8	33.6	33.4	33.4	30.0	42.3	37.0	36.8	32.7	4.46	4.72	4.37
Midwest	34.3	34.4	27.3	30.7	42.2	35.4	36.5	33.9	34.6	4.49	3.75	5.72
South	16.6	11.2	14.1	16.6	19.3	15.5	23.3	17.0	16.2	2.69	2.66	3.05
West	27.2	23.0	24.0	28.4	29.0	27.9	31.7	26.0	28.5	4.90	4.88	5.05
<u>Tags</u>												
Northeast	12.5	11.6	10.5	11.3	16.9	13.8	11.6	12.6	12.4	2.60	2.62	2.61
Midwest	8.2	6.2	8.8	7.3	10.0	8.4	8.4	9.0	7.3	1.70	2.09	1.52
South	9.6	8.6	10.0	8.0	8.1	14.2	8.8	10.6	8.4	2.83	3.06	2.76
West	9.9	6.8	11.7	10.0	11.7	12.6	6.5	10.4	9.3	3.63	4.39	2.90
<u>Grade I</u>												
Northeast	27.8	25.9	26.5	29.7	26.6	27.6	31.1	25.9	29.8	4.45	4.58	4.44
Midwest	34.4	33.2	36.5	36.9	27.1	37.4	35.5	33.2	35.7	7.73	6.54	9.10
South	33.1	31.3	31.1	31.9	35.3	37.4	31.7	33.4	32.9	4.20	4.31	4.24
West	38.0	37.5	36.3	35.2	38.7	39.5	41.3	37.9	38.1	3.20	3.58	3.66
<u>Grade II</u>												
Northeast	24.7	28.4	29.6	25.7	26.1	16.3	20.2	24.6	24.8	3.63	4.14	3.36
Midwest	23.1	26.2	27.3	25.1	20.8	18.8	19.6	23.9	22.3	5.10	5.82	4.96
South	40.4	48.9	44.7	43.1	36.6	32.9	36.2	38.8	42.2	3.31	3.35	3.43
West	24.5	32.5	26.4	26.3	20.5	19.9	20.5	25.4	23.6	5.20	6.02	4.87
<u>Grade III</u>												
Northeast	0.1	0.4	-	-	0.4	-	-	-	0.3	0.08	-	0.16
Midwest	-	-	-	-	-	-	-	-	-	-	-	-
South	0.2	-	-	0.3	0.7	-	-	0.1	0.2	0.16	0.09	0.24
West	0.3	0.2	1.4	-	-	-	-	0.2	0.4	0.25	0.18	0.34
ORAL PHARYNX												
<u>Abnormality</u>												
Northeast	6.5	4.1	6.7	4.5	9.9	7.8	6.8	7.1	5.9	1.96	1.69	2.28
Midwest	3.9	2.8	4.7	4.7	2.6	4.6	4.2	5.0	2.8	0.54	0.83	0.47
South	9.1	9.2	8.0	8.5	7.6	10.3	11.2	8.8	9.4	2.48	2.95	2.16
West	7.5	9.6	11.5	4.1	6.6	4.0	9.0	7.7	7.3	3.82	4.11	3.61

Table 18. Prevalence rates of findings from examination of the tonsils and oral pharynx among youths aged 12-17 years, by family income, age, and sex, with total standard errors: United States, 1966-70

Examination finding and annual family income	Ages 12-17	Age in years						Boys 12-17 years	Girls 12-17 years	Total 12-17 years	Boys 12-17 years	Girls 12-17 years
		12	13	14	15	16	17					
TONSILS												
<u>Not visible</u>												
		Rate per 100 youths								Standard error in percent		
Less than \$3,000	11.8	9.8	8.1	11.0	14.6	13.8	13.9	10.0	13.5	1.86	2.10	2.36
\$3,000-\$4,999	18.6	18.3	14.9	15.1	18.1	20.4	26.4	19.2	18.0	2.16	2.30	2.69
\$5,000-\$6,999	27.3	24.7	24.1	25.6	28.7	26.9	34.9	27.9	26.7	2.60	2.93	2.98
\$7,000-\$9,999	35.0	32.7	31.8	35.9	38.1	35.5	36.8	32.4	37.9	2.07	1.90	2.96
\$10,000-\$14,999	34.4	33.4	32.6	32.3	34.3	36.8	38.0	37.8	31.3	2.62	2.92	3.20
\$15,000 or more	34.1	29.3	27.6	30.9	43.2	37.6	35.9	32.8	35.7	3.68	3.90	4.11
<u>Tags</u>												
Less than \$3,000	5.4	5.0	4.0	4.6	4.5	7.2	7.5	5.9	5.0	0.85	1.37	0.99
\$3,000-\$4,999	7.9	7.4	8.5	4.4	11.1	8.9	7.6	8.6	7.2	1.82	2.15	1.76
\$5,000-\$6,999	10.6	7.6	14.1	11.5	11.7	12.6	6.1	10.6	10.7	1.98	2.50	2.19
\$7,000-\$9,999	9.6	6.5	8.8	8.2	12.6	11.5	10.5	10.8	8.2	0.87	1.21	1.03
\$10,000-\$14,999	13.4	9.4	14.4	12.3	16.6	16.8	11.4	12.6	14.2	2.08	2.19	2.35
\$15,000 or more	12.4	15.1	13.6	13.4	10.9	12.6	9.0	14.9	9.5	2.45	2.83	2.61
<u>Grade I</u>												
Less than \$3,000	38.5	28.9	34.8	43.9	39.2	44.4	40.2	40.4	36.7	3.63	4.03	4.48
\$3,000-\$4,999	34.6	31.0	35.3	29.5	41.9	41.3	30.6	34.2	35.1	3.08	3.87	3.02
\$5,000-\$6,999	33.8	34.1	31.2	31.1	35.1	36.2	36.2	31.8	35.8	2.55	3.02	3.00
\$7,000-\$9,999	32.7	32.2	34.4	33.7	28.2	33.8	34.2	33.4	31.8	3.26	2.93	4.00
\$10,000-\$14,999	30.9	34.6	29.1	33.7	26.0	30.7	30.9	27.4	34.2	3.47	3.04	4.47
\$15,000 or more	33.2	28.2	36.4	32.6	27.0	36.2	38.2	33.6	32.9	4.86	4.78	5.53
<u>Grade II</u>												
Less than \$3,000	43.9	56.3	53.1	39.6	40.5	34.6	38.4	43.5	44.2	3.85	4.13	4.52
\$3,000-\$4,999	38.6	42.2	41.3	50.9	28.2	29.4	35.4	37.9	39.3	3.20	3.80	3.40
\$5,000-\$6,999	28.0	33.6	29.2	31.8	24.4	24.3	22.8	29.7	26.3	2.69	3.51	2.92
\$7,000-\$9,999	22.6	28.7	24.3	22.1	21.1	19.3	18.5	23.2	21.9	2.82	3.08	2.75
\$10,000-\$14,999	21.2	22.6	24.0	21.8	23.1	15.7	19.7	22.2	20.3	2.05	2.98	2.09
\$15,000 or more	20.3	27.4	22.5	23.0	18.8	13.6	16.9	18.8	21.9	2.71	3.53	3.34
<u>Grade III</u>												
Less than \$3,000	0.4	-	-	0.7	1.3	-	-	0.2	0.5	0.35	0.23	0.46
\$3,000-\$4,999	0.3	1.0	-	-	0.6	-	-	0.2	0.4	0.18	0.17	0.32
\$5,000-\$6,999	0.2	-	1.3	-	-	-	-	-	0.4	0.22	-	0.44
\$7,000-\$9,999	0.1	-	0.6	-	-	-	-	0.1	0.2	0.08	0.09	0.14
\$10,000-\$14,999	-	-	-	-	-	-	-	-	-	-	-	-
\$15,000 or more	-	-	-	-	-	-	-	-	-	-	-	-
ORAL PHARYNX												
<u>Abnormality</u>												
Less than \$3,000	9.1	10.0	15.0	4.2	5.7	8.8	10.8	10.2	8.2	3.34	4.39	2.56
\$3,000-\$4,999	8.0	8.4	4.5	8.9	10.4	8.1	8.5	7.4	8.7	2.09	1.89	2.55
\$5,000-\$6,999	4.9	5.2	5.7	4.9	3.3	5.6	4.5	4.9	4.9	0.88	0.86	1.38
\$7,000-\$9,999	6.6	5.2	8.8	4.8	6.6	6.5	7.9	7.8	5.2	1.18	1.20	1.59
\$10,000-\$14,999	5.9	6.5	4.5	7.0	4.6	4.2	8.3	6.7	5.0	0.92	1.27	1.23
\$15,000 or more	5.0	5.3	7.7	1.6	8.0	3.3	4.2	5.5	4.5	1.42	1.84	1.29

Table 19. Prevalence rates of findings from the ear, nose, and throat examination among youths aged 12-17 years with some parent-reported history of an ear or hearing problem, with standard errors for total rates: United States, 1966-70

Condition on examination	Total prevalence rate	History of abnormality							Standard error for abnormal findings
		Hearing trouble	Earaches	Injury to ear	Drum opened	Other ear operation	Running ears	Other ear trouble	
Prevalence rates per 100 youths reported by parent									
Total prevalence rate		3.7	15.1	3.6	3.0	0.9	9.4	3.6	
<u>Auditory canal, right</u>									
Normal	88.4	3.5	14.7	3.5	3.1	0.9	9.2	3.4	0.66
Abnormal	11.6	5.2	18.4	4.1	2.9	1.0	10.4	5.5	
<u>Auditory canal, left</u>									
Normal	88.3	3.6	14.8	3.4	3.2	1.0	9.2	3.4	0.64
Abnormal	11.7	4.4	17.1	4.2	2.1	0.4	10.6	4.8	
<u>Drum, right</u>									
Normal	82.6	2.8	14.0	2.8	2.4	0.7	7.7	3.3	1.54
Abnormal	10.4	9.2	21.6	9.3	8.2	2.7	21.4	5.0	
Not visible	6.9	5.9	17.8	3.6	2.6	0.5	10.6	5.3	
<u>Drum, left</u>									
Normal	82.6	2.8	13.9	2.7	2.5	0.7	7.8	3.2	1.45
Abnormal	10.4	9.9	23.2	9.9	7.5	2.8	21.8	6.8	
Not visible	7.0	5.2	17.7	4.2	2.4	0.3	9.8	4.1	
<u>Tonsils</u>									
Not visible	28.4	4.7	15.4	5.6	5.7	1.8	11.8	4.3	1.88
Tags present	9.9	4.6	14.0	5.1	3.5	1.1	10.9	4.8	1.24
Grade I	33.6	2.9	13.8	2.5	2.4	0.6	8.2	3.4	2.54
Grade II	27.9	3.2	16.8	2.0	1.0	0.3	7.6	2.7	2.18
Grade III	0.1	8.8	8.8	-	-	-	9.1	-	0.07
<u>Oral pharynx</u>									
Normal	93.4	3.7	14.8	3.5	3.1	0.9	9.2	3.5	1.14
Abnormal	6.6	3.5	19.3	4.3	2.6	1.1	11.6	4.6	
<u>Nose, right</u>									
Normal	92.0	3.6	15.1	3.5	3.0	0.9	9.3	3.6	1.16
Abnormal	8.0	4.7	14.4	3.7	3.3	1.2	9.6	3.6	
<u>Nose, left</u>									
Normal	92.0	3.6	15.0	3.5	3.0	0.9	9.4	3.5	1.24
Abnormal	8.0	4.6	15.7	4.3	3.1	1.4	9.3	4.2	
Standard error, total		0.28	0.80	0.28	0.35	0.16	0.53	0.22	

Table 20. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without parent-reported trouble hearing, by age and sex, with standard errors for total averages: United States, 1966-70

Age and sex	250 Hz		500 Hz		1000 Hz		2000 Hz	
	Trouble hearing	None	Trouble hearing	None	Trouble hearing	None	Trouble hearing	None
<u>Both sexes</u>								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	14.5	9.0	12.2	5.6	8.5	1.3	7.6	0.8
12 years	15.8	9.0	13.8	6.2	9.8	1.7	7.7	0.8
13 years	14.2	9.3	13.2	6.0	10.8	1.4	10.1	0.8
14 years	14.6	8.4	12.3	5.6	8.2	1.2	8.4	0.8
15 years	13.2	8.8	10.4	5.7	6.1	1.3	3.6	1.2
16 years	16.2	8.8	15.0	5.2	13.3	1.0	11.9	0.7
17 years	13.6	9.2	9.4	5.3	5.0	1.2	5.6	0.7
<u>Boys</u>								
Total, 12-17 years	14.6	8.9	12.0	5.8	9.8	1.6	8.6	1.2
12 years	14.0	8.9	13.0	6.4	10.4	2.0	8.2	1.6
13 years	12.6	9.0	12.1	6.0	11.8	1.7	11.4	1.3
14 years	13.0	8.6	11.2	6.0	8.6	1.5	6.2	1.2
15 years	13.0	8.8	10.9	6.0	7.8	1.4	5.0	1.4
16 years	16.8	8.9	13.0	5.6	14.2	1.2	13.8	0.8
17 years	18.8	9.2	12.8	5.2	8.0	1.4	8.8	1.2
<u>Girls</u>								
Total, 12-17 years	14.4	9.0	12.2	5.4	7.1	1.1	6.6	0.4
12 years	18.2	9.2	15.1	6.0	9.0	1.4	7.2	0.2
13 years	16.6	9.6	14.8	5.8	9.4	1.2	8.2	0.4
14 years	15.8	8.4	13.2	5.0	7.9	1.0	10.0	0.2
15 years	13.4	8.8	10.0	5.5	4.5	1.2	2.3	0.8
16 years	15.8	8.7	16.8	4.8	12.4	0.9	10.3	0.6
17 years	7.6	9.4	5.3	5.4	1.2	0.9	1.6	0.2
<u>Standard error</u>								
Total, 12-17 years	1.00	0.35	0.90	0.20	0.95	0.20	0.65	0.20
Boys, 12-17 years	1.50	0.35	1.20	0.20	1.20	0.25	1.05	0.25
Girls, 12-17 years	1.05	0.35	1.10	0.20	1.15	0.20	1.15	0.20

Table 20. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without parent-reported trouble hearing, by age and sex, with standard errors for total averages: United States, 1966-70—Con.

Age and sex	3000 Hz		4000 Hz		6000 Hz		8000 Hz		Speech	
	Trouble hearing	None	Trouble hearing	None	Trouble hearing	None	Trouble hearing	None	Trouble hearing	None
Decibels re audiometric zero (ANSI, 1969)										
Both sexes										
Total, 12-17 years	12.6	5.0	15.9	7.7	20.0	10.8	16.7	6.3	11.6	4.8
12 years	11.6	5.0	15.8	7.7	17.8	10.0	18.2	6.7	13.2	5.2
13 years	16.2	5.2	20.4	8.0	22.4	10.6	20.2	6.8	13.6	4.9
14 years	11.6	4.9	14.6	7.4	18.8	10.5	15.0	6.1	11.6	4.8
15 years	11.2	5.3	15.9	7.6	18.8	11.0	14.4	6.5	8.8	5.0
16 years	16.3	4.9	18.2	7.6	24.8	11.8	19.4	5.8	15.0	4.4
17 years	10.8	4.8	12.2	7.8	19.3	11.0	15.6	6.0	9.0	4.6
Boys										
Total, 12-17 years	14.8	6.2	18.7	8.8	23.0	12.2	18.8	7.0	12.5	5.0
12 years	13.4	6.0	18.8	8.6	20.9	11.2	20.0	7.4	13.3	5.6
13 years	19.0	6.3	22.8	8.9	27.2	11.5	23.1	7.4	14.0	5.1
14 years	11.4	6.1	13.2	8.4	19.2	11.8	12.6	6.6	10.8	5.2
15 years	12.8	6.4	18.9	8.8	21.2	12.2	19.2	7.1	10.0	5.1
16 years	19.6	6.3	23.0	8.8	24.8	13.6	20.6	7.0	15.9	4.6
17 years	14.3	5.8	17.2	9.6	25.4	13.4	18.2	6.6	12.6	4.8
Girls										
Total, 12-17 years	10.5	3.8	13.0	6.5	17.0	9.4	14.6	5.6	10.6	4.6
12 years	9.4	4.0	11.9	6.8	13.8	8.9	15.8	6.0	13.2	4.7
13 years	12.3	4.2	17.2	7.0	15.6	9.6	16.2	6.2	13.2	4.8
14 years	11.6	3.6	15.6	6.4	18.4	9.2	16.7	5.6	12.2	4.4
15 years	9.6	4.2	13.0	6.4	16.6	9.8	9.6	5.8	7.8	4.8
16 years	13.4	3.4	14.0	6.4	24.7	9.8	18.4	4.5	14.4	4.2
17 years	6.6	3.8	6.3	6.2	12.1	8.7	12.4	5.3	4.8	4.4
Standard error										
Total, 12-17 years	1.15	0.25	0.85	0.30	1.10	0.35	1.20	0.45	0.85	0.15
Boys, 12-17 years	1.80	0.25	1.85	0.35	1.80	0.40	2.05	0.45	1.15	0.20
Girls, 12-17 years	1.45	0.25	1.45	0.25	1.75	0.30	1.70	0.45	1.15	0.15

Table 21. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without parent-reported earaches, by age and sex, with standard errors for total averages: United States, 1966-70

Age and sex	250 Hz		500 Hz		1000 Hz		2000 Hz	
	Earaches	None	Earaches	None	Earaches	None	Earaches	None
Both sexes								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	10.1	9.0	7.1	5.7	3.1	1.3	1.8	1.0
12 years	9.8	9.2	6.8	6.2	2.6	1.8	1.6	1.0
13 years	10.9	9.2	7.4	6.0	3.9	1.4	2.0	1.0
14 years	9.8	8.6	7.4	5.6	3.2	1.3	2.3	0.9
15 years	9.6	8.8	7.5	5.6	3.6	1.1	1.8	1.2
16 years	10.4	8.8	7.2	5.2	2.8	1.2	1.8	0.8
17 years	10.6	9.3	6.0	5.4	2.4	1.1	1.2	0.9
Boys								
Total, 12-17 years	10.2	9.0	7.4	5.9	3.5	1.6	2.4	1.4
12 years	9.8	8.9	7.8	6.4	3.8	2.0	3.2	1.5
13 years	10.2	9.0	7.4	6.1	2.8	1.9	2.2	1.6
14 years	10.5	8.4	7.6	6.1	4.2	1.5	2.8	1.2
15 years	9.4	8.8	7.1	6.0	3.4	1.4	1.6	1.6
16 years	11.2	8.9	8.0	5.5	3.2	1.4	1.9	1.0
17 years	11.2	9.4	7.0	5.4	3.4	1.4	2.2	1.4
Girls								
Total, 12-17 years	10.0	9.0	6.8	5.4	2.8	1.0	1.4	0.5
12 years	9.7	9.4	6.2	6.2	1.8	1.6	0.6	0.3
13 years	11.4	9.4	7.4	5.8	4.6	0.8	1.8	0.4
14 years	9.4	8.6	7.4	5.0	2.6	1.0	2.0	0.5
15 years	9.8	8.8	7.8	5.2	3.6	0.8	2.0	0.7
16 years	10.0	8.7	6.9	4.8	2.6	1.0	1.8	0.8
17 years	10.2	9.1	5.3	5.4	1.9	0.8	0.5	0.3
Standard error								
Total, 12-17 years	0.40	0.35	0.25	0.20	0.35	0.25	0.30	0.20
Boys, 12-17 years	0.60	0.35	0.40	0.20	0.50	0.25	0.45	0.25
Girls, 12-17 years	0.35	0.40	0.30	0.25	0.40	0.20	0.35	0.20

Table 21. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without parent-reported earaches, by age and sex, with standard errors for total averages: United States, 1966-70—Con.

Age and sex	3000 Hz		4000 Hz		6000 Hz		8000 Hz		Speech	
	Earaches	None	Earaches	None	Earaches	None	Earaches	None	Earaches	None
Both sexes										
Decibels re audiometric zero (ANSI, 1969)										
Total, 12-17 years . . .	6.0	5.2	8.8	7.8	12.3	11.0	7.9	6.5	6.2	4.8
12 years	5.8	5.2	8.8	7.8	11.2	10.0	8.1	6.8	6.0	5.2
13 years	6.4	5.4	9.6	8.2	12.8	10.6	8.4	7.0	6.8	4.9
14 years	5.5	5.2	8.0	7.6	12.0	10.7	7.3	6.4	6.5	4.8
15 years	6.7	5.4	9.4	7.7	13.0	11.0	7.4	6.7	6.4	4.9
16 years	5.8	5.1	8.8	7.8	13.2	12.0	8.2	5.8	6.0	4.5
17 years	6.0	5.0	8.6	8.0	12.2	11.4	8.0	6.2	5.6	4.6
Boys										
Total, 12-17 years . . .	7.6	6.3	10.8	9.0	14.2	12.4	9.3	7.2	6.8	5.2
12 years	8.0	6.0	11.1	8.6	13.1	11.2	10.3	7.4	7.4	5.5
13 years	7.8	6.6	10.2	9.3	13.6	11.8	8.6	7.9	6.6	5.2
14 years	7.1	6.2	9.2	8.4	13.4	11.8	7.8	6.7	7.2	5.2
15 years	8.3	6.4	12.8	8.7	15.1	12.2	9.8	7.3	6.0	5.2
16 years	7.4	6.5	10.0	9.0	13.7	13.8	9.0	7.0	6.3	4.8
17 years	6.6	6.1	11.0	9.8	16.8	13.6	9.8	6.9	6.5	5.0
Girls										
Total, 12-17 years . . .	5.0	3.9	7.6	6.6	11.2	9.3	7.0	5.6	5.9	4.5
12 years	4.4	4.1	7.3	6.8	10.0	8.8	6.7	6.2	5.2	4.9
13 years	5.3	4.2	9.1	6.9	12.2	9.3	8.2	6.0	7.0	4.6
14 years	4.6	4.0	7.2	6.8	11.0	9.4	7.0	6.0	6.0	4.5
15 years	5.5	4.1	7.0	6.6	11.5	9.7	5.7	6.1	6.6	4.6
16 years	5.0	3.4	8.3	6.2	13.0	9.8	7.8	4.4	5.8	4.2
17 years	5.5	3.7	7.2	6.0	9.2	8.8	7.0	5.4	5.0	4.4
Standard error										
Total, 12-17 years . . .	0.25	0.20	0.40	0.25	0.45	0.30	0.60	0.45	0.25	0.15
Boys, 12-17 years	0.45	0.20	0.65	0.35	0.85	0.45	0.85	0.45	0.40	0.15
Girls, 12-17 years	0.30	0.30	0.40	0.25	0.35	0.25	0.60	0.45	0.30	0.15

Table 22. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without parent-reported ear injury, by age and sex with standard errors for total averages: United States, 1966-70

Age and sex	250 Hz		500 Hz		1000 Hz		2000 Hz	
	Ear injury	None	Ear injury	None	Ear injury	None	Ear injury	None
Both sexes								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	13.0	9.0	9.1	5.8	5.0	1.4	4.3	1.0
12 years	12.2	9.2	10.6	6.2	6.1	1.8	4.1	1.0
13 years	13.4	9.3	9.4	6.0	4.8	1.6	4.7	1.0
14 years	12.5	8.6	8.6	5.8	5.2	1.4	6.1	0.9
15 years	11.6	8.9	8.1	5.8	4.2	1.4	3.1	1.2
16 years	13.0	8.9	7.8	5.4	4.0	1.4	3.2	0.9
17 years	14.8	9.2	9.8	5.2	5.2	1.1	4.4	0.8
Boys								
Total, 12-17 years	12.1	9.0	8.5	6.0	4.2	1.8	4.6	1.4
12 years	13.3	9.0	11.2	6.4	6.6	2.1	6.0	1.6
13 years	9.6	9.2	7.3	6.2	1.0	2.0	1.5	1.6
14 years	9.6	8.6	7.2	6.2	4.3	1.7	5.6	1.3
15 years	13.6	8.8	8.4	6.1	4.3	1.6	4.7	1.5
16 years	10.8	9.0	6.0	5.7	2.8	1.5	1.7	1.0
17 years	15.4	9.3	10.8	5.2	6.0	1.4	7.2	1.2
Girls								
Total, 12-17 years	14.0	9.0	9.7	5.5	5.8	1.2	4.0	0.6
12 years	11.5	9.4	10.1	6.0	5.7	1.5	2.7	0.3
13 years	19.3	9.4	12.8	5.9	10.6	1.2	9.7	0.4
14 years	15.6	8.4	10.0	5.2	6.2	1.1	6.6	0.5
15 years	9.2	9.0	7.8	5.6	4.0	1.2	1.4	0.9
16 years	15.4	8.7	9.6	5.0	5.1	1.2	4.8	0.8
17 years	14.0	9.0	8.4	5.2	4.0	0.8	0.4	0.4
Standard error								
Total, 12-17 years	0.75	0.35	0.65	0.20	0.60	0.20	0.65	0.20
Boys, 12-17 years	1.10	0.35	0.75	0.20	0.75	0.30	0.90	0.25
Girls, 12-17 years	1.10	0.35	1.10	0.20	1.05	0.20	0.95	0.20

Table 22. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without parent-reported ear injury, by age and sex, with standard errors for total averages: United States, 1966-70—Con.

Age and sex	3000 Hz		4000 Hz		6000 Hz		8000 Hz		Speech	
	Ear injury	None	Ear injury	None	Ear injury	None	Ear injury	None	Ear injury	None
Decibels re audiometric zero (ANSI, 1969)										
Both sexes										
Total, 12-17 years	9.0	5.2	13.2	7.8	17.7	10.9	11.9	6.5	8.3	5.0
12 years	8.4	5.2	12.1	7.8	15.4	10.1	11.0	6.9	9.6	5.2
13 years	11.2	5.4	15.9	8.1	18.5	10.7	14.5	7.0	8.6	5.0
14 years	8.6	5.1	11.6	7.5	18.4	10.6	11.2	6.3	8.6	5.0
15 years	7.8	5.4	10.8	7.8	14.2	11.2	8.2	6.8	7.2	5.0
16 years	7.0	5.2	12.2	7.8	17.9	11.9	10.8	6.0	7.0	4.6
17 years	10.3	4.8	16.0	7.6	21.0	11.0	15.0	6.0	8.6	4.6
Boys										
Total, 12-17 years	10.0	6.4	14.3	9.0	18.6	12.4	11.9	7.2	7.7	5.2
12 years	10.2	6.2	16.8	8.7	18.6	11.2	11.8	7.7	10.2	5.6
13 years	10.0	6.6	12.6	9.2	17.5	11.8	12.4	7.8	5.8	5.4
14 years	8.9	6.2	10.2	8.4	17.4	11.8	9.0	6.8	7.2	5.4
15 years	10.0	6.6	13.8	9.0	15.2	12.5	11.4	7.4	7.6	5.2
16 years	7.2	6.6	13.1	9.0	14.6	13.8	9.0	7.2	5.2	4.8
17 years	12.4	5.8	18.8	9.4	25.2	13.3	16.2	6.6	9.9	4.8
Girls										
Total, 12-17 years	7.8	4.0	11.9	6.6	16.7	9.4	11.9	5.7	9.0	4.6
12 years	7.0	4.0	8.8	6.9	13.0	8.9	10.3	6.1	9.1	4.8
13 years	13.2	4.1	21.1	6.9	20.0	9.6	17.9	6.1	13.2	4.7
14 years	8.1	3.9	13.1	6.6	19.4	9.4	13.8	5.8	10.3	4.6
15 years	5.4	4.4	7.4	6.7	13.2	9.9	4.7	6.0	7.0	4.8
16 years	6.8	3.6	11.2	6.4	21.2	10.0	12.6	4.8	8.6	4.4
17 years	7.4	3.8	12.1	6.0	15.0	8.6	13.3	5.4	6.8	4.4
Standard error										
Total, 12-17 years	0.90	0.20	1.05	0.25	0.95	0.30	1.05	0.45	0.60	0.15
Boys, 12-17 years	1.10	0.25	1.70	0.40	1.45	0.45	1.60	0.45	0.80	0.20
Girls, 12-17 years	1.15	0.25	0.90	0.25	1.45	0.25	1.30	0.45	0.95	0.10

Table 23. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without parent-reported drum opened, by age and sex, with standard errors for total averages: United States, 1966-70

Age and sex	250 Hz		500 Hz		1000 Hz		2000 Hz	
	Drum opened	Not opened	Drum opened	Not opened	Drum opened	Not opened	Drum opened	Not opened
<u>Both sexes</u>								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	11.0	9.1	7.5	5.8	4.6	1.5	3.7	1.0
12 years	10.1	9.2	7.2	6.4	4.2	1.9	2.0	1.0
13 years	10.0	9.4	8.2	6.1	4.6	1.6	6.3	1.0
14 years	12.8	8.6	9.6	5.7	7.2	1.4	5.7	1.0
15 years	10.9	8.9	7.1	5.9	3.4	1.4	3.2	1.2
16 years	12.6	9.0	8.3	5.4	3.8	1.4	1.5	1.0
17 years	10.0	9.4	4.8	5.4	3.8	1.2	2.9	0.8
<u>Boys</u>								
Total, 12-17 years	10.7	9.0	7.8	6.0	5.5	1.7	4.6	1.4
12 years	11.8	9.0	9.0	6.4	7.2	2.1	5.6	1.6
13 years	10.6	9.2	8.5	6.2	6.0	1.9	8.1	1.4
14 years	10.4	8.6	9.0	6.2	7.0	1.6	4.9	1.3
15 years	11.6	8.8	6.4	6.2	3.8	1.6	2.8	1.6
16 years	11.8	9.1	7.5	5.8	1.8	1.6	-0.4	1.2
17 years	8.4	9.6	5.8	5.6	5.2	1.5	3.7	1.4
<u>Girls</u>								
Total, 12-17 years	11.4	9.1	7.2	5.6	3.6	1.2	2.8	0.6
12 years	8.6	9.5	5.6	6.2	1.6	1.6	-1.2	0.4
13 years	9.0	9.7	7.6	6.0	2.6	1.4	3.5	0.5
14 years	16.8	8.6	10.4	5.3	7.4	1.2	7.0	0.6
15 years	10.0	9.0	7.9	5.6	2.7	1.3	3.8	0.8
16 years	13.2	8.8	8.8	5.1	5.2	1.2	2.8	0.9
17 years	11.6	9.2	3.8	5.4	2.4	0.8	2.0	0.3
<u>Standard error</u>								
Total, 12-17 years	0.85	0.35	0.65	0.20	0.65	0.20	0.70	0.20
Boys, 12-17 years	0.90	0.35	0.80	0.20	0.75	0.30	1.05	0.25
Girls, 12-17 years	1.35	0.35	0.85	0.20	0.85	0.20	0.90	0.20

Table 23. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without parent-reported drum opened, by age and sex, with standard errors for total averages: United States, 1966-70—Con.

Age and sex	3000 Hz		4000 Hz		6000 Hz		8000 Hz		Speech	
	Drum opened	Not opened	Drum opened	Not opened	Drum opened	Not opened	Drum opened	Not opened	Drum opened	Not opened
Decibels re audiometric zero (ANSI, 1969)										
<u>Both sexes</u>										
Total, 12-17 years	7.4	5.2	10.9	7.9	15.2	11.0	10.5	6.6	7.4	5.0
12 years	6.2	5.2	10.0	7.9	12.4	10.2	10.4	7.0	6.9	5.3
13 years	11.0	5.4	14.6	8.2	18.2	10.7	13.0	7.0	8.6	5.0
14 years	8.7	5.1	13.4	7.5	17.8	10.6	12.6	6.2	9.2	5.0
15 years	6.2	5.5	8.4	8.0	13.4	11.2	8.6	6.8	6.4	5.0
16 years	6.7	5.2	7.0	8.0	14.6	12.1	8.5	6.2	7.4	4.6
17 years	5.8	5.0	10.8	8.0	14.8	11.3	9.1	6.3	5.8	4.8
<u>Boys</u>										
Total, 12-17 years	8.9	6.4	13.0	9.0	17.0	12.4	11.5	7.3	8.2	5.2
12 years	8.7	6.2	14.4	8.8	15.1	11.3	13.5	7.6	9.4	5.6
13 years	13.2	6.5	18.2	9.0	20.8	11.7	15.2	7.7	9.7	5.2
14 years	9.4	6.2	13.8	8.3	17.6	11.8	10.6	6.6	8.8	5.2
15 years	7.2	6.7	8.4	9.2	12.9	12.6	9.6	7.6	6.6	5.3
16 years	4.8	6.8	7.6	9.2	14.0	13.9	8.3	7.3	6.3	4.9
17 years	7.6	6.1	12.6	9.8	19.8	13.8	10.2	7.0	7.0	5.0
<u>Girls</u>										
Total, 12-17 years	5.8	4.0	8.6	6.7	13.2	9.6	9.4	5.8	6.6	4.7
12 years	3.9	4.2	6.2	7.0	10.0	9.0	7.7	6.2	4.6	5.0
13 years	7.3	4.2	8.8	7.2	14.1	9.7	9.3	6.4	6.6	4.9
14 years	7.6	4.0	12.9	6.6	18.1	9.5	15.9	5.9	10.1	4.6
15 years	4.8	4.4	8.4	6.7	14.0	9.9	7.4	6.0	6.3	4.8
16 years	8.1	3.6	6.6	6.6	15.1	10.2	8.6	4.9	8.2	4.4
17 years	4.0	4.0	9.0	6.1	9.8	8.8	7.9	5.6	4.7	4.4
<u>Standard error</u>										
Total, 12-17 years	0.85	0.25	1.00	0.30	1.00	0.30	1.00	0.45	0.60	0.15
Boys, 12-17 years	1.65	0.25	1.80	0.40	1.65	0.45	1.70	0.50	0.85	0.20
Girls, 12-17 years	0.90	0.25	0.95	0.25	1.15	0.25	1.00	0.45	0.75	0.10

Table 24. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without parent-reporting running ears, by age and sex, with standard errors for total averages: United States, 1966-70—Con.

Age and sex	250 Hz		500 Hz		1000 Hz		2000 Hz	
	Running ears	None	Running ears	None	Running ears	None	Running ears	None
Both sexes								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	11.0	9.0	7.4	5.7	3.4	1.4	2.2	1.0
12 years	10.4	9.2	7.2	6.2	3.8	1.8	1.9	1.0
13 years	11.2	9.2	7.6	6.0	3.2	1.6	1.2	1.1
14 years	10.4	8.6	7.1	5.7	3.6	1.4	2.4	1.0
15 years	10.8	8.8	7.6	5.8	2.8	1.4	1.2	1.2
16 years	11.0	8.8	7.1	5.4	3.1	1.3	2.8	0.8
17 years	13.2	9.1	8.2	5.2	4.3	1.0	3.8	0.6
Boys								
Total, 12-17 years	11.0	8.9	7.4	6.0	3.2	1.7	2.5	1.4
12 years	10.7	8.8	7.2	6.4	3.7	2.1	3.8	1.6
13 years	10.6	9.0	7.4	6.1	1.7	2.0	0.6	1.8
14 years	9.6	8.6	6.8	6.2	3.4	1.6	2.8	1.3
15 years	9.3	8.9	5.8	6.2	1.8	1.6	0.4	1.7
16 years	12.0	9.0	8.6	5.6	3.0	1.5	2.8	1.0
17 years	14.2	9.1	9.2	5.2	5.2	1.2	4.4	1.2
Girls								
Total, 12-17 years	11.2	9.0	7.5	5.5	3.7	1.0	1.8	0.6
12 years	10.0	9.4	7.2	6.0	3.8	1.4	-0.2	0.4
13 years	11.6	9.5	7.9	5.9	4.7	1.0	1.6	0.4
14 years	11.0	8.5	7.4	5.2	3.9	1.0	2.2	0.6
15 years	12.0	8.6	9.0	5.2	3.6	1.0	2.0	0.8
16 years	10.4	8.8	6.2	5.1	3.2	1.0	2.8	0.8
17 years	11.6	9.0	6.8	5.2	3.0	0.8	3.1	0.2
Standard error								
Total, 12-17 years	0.45	0.35	0.35	0.20	0.45	0.20	0.45	0.20
Boys, 12-17 years	0.65	0.35	0.50	0.25	0.65	0.25	0.70	0.25
Girls, 12-17 years	0.60	0.35	0.45	0.20	0.50	0.20	0.40	0.20

Table 24. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without parent-reported running ears, by age and sex, with standard errors for total averages: United States, 1966-70

Age and sex	3000 Hz		4000 Hz		6000 Hz		8000 Hz		Speech	
	Running ears	None	Running ears	None	Running ears	None	Running ears	None	Running ears	None
Both sexes										
Decibels re audiometric zero (ANSI, 1969)										
Total, 12-17 years . . .	6.8	5.2	9.8	7.8	14.0	10.8	9.4	6.4	6.6	4.9
12 years	6.9	5.0	9.5	7.8	12.0	10.0	9.0	6.8	6.8	5.2
13 years	6.6	5.4	9.1	8.2	12.8	10.8	8.5	7.0	6.2	5.0
14 years	6.3	5.1	9.2	7.5	13.2	10.6	9.0	6.2	6.6	5.0
15 years	6.2	5.5	9.0	7.8	14.6	11.0	9.0	6.6	6.2	5.0
16 years	6.4	5.2	9.9	7.8	14.9	11.9	8.2	6.0	6.2	4.6
17 years	8.6	4.8	12.5	7.6	17.0	10.9	13.6	5.8	7.6	4.5
Boys										
Total, 12-17 years . . .	7.8	6.4	11.1	9.0	15.2	12.4	9.8	7.2	6.6	5.2
12 years	7.8	6.2	11.0	8.7	14.3	11.1	9.4	7.6	7.3	5.6
13 years	7.8	6.6	10.0	9.3	13.8	11.8	8.2	8.0	5.7	5.4
14 years	7.3	6.2	9.4	8.4	12.1	12.0	8.4	6.6	6.4	5.3
15 years	5.4	6.8	8.8	9.2	14.8	12.4	9.0	7.5	5.0	5.4
16 years	8.6	6.6	13.0	9.0	16.3	13.8	8.9	7.2	6.6	4.8
17 years	9.8	5.7	15.1	9.3	21.0	13.2	15.0	6.3	8.4	4.8
Girls										
Total, 12-17 years . . .	5.8	4.0	8.5	6.6	12.7	9.3	9.2	5.6	6.6	4.6
12 years	5.9	4.0	7.8	6.8	9.5	9.0	8.7	6.0	6.4	4.8
13 years	5.4	4.2	8.2	7.2	11.8	9.6	8.8	6.2	6.8	4.8
14 years	5.4	3.9	9.0	6.6	14.4	9.2	9.7	5.8	6.7	4.6
15 years	6.8	4.0	9.3	6.4	14.4	9.5	9.0	5.6	7.2	4.6
16 years	5.0	3.6	7.8	6.4	14.0	10.0	7.8	4.7	6.0	4.4
17 years	6.9	3.8	8.8	6.0	11.4	8.7	11.6	5.2	6.4	4.3
Standard error										
Total, 12-17 years . . .	0.40	0.25	0.55	0.30	0.60	0.35	0.60	0.45	0.30	0.15
Boys, 12-17 years	0.65	0.25	0.90	0.40	0.85	0.45	0.85	0.50	0.50	0.20
Girls, 12-17 years	0.55	0.30	0.50	0.25	0.80	0.25	0.70	0.45	0.30	0.10

Table 25. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without parent-reported other ear operation, by age and sex, with standard errors for total averages: United States, 1966-70

Age and sex	250 Hz		500 Hz		1000 Hz		2000 Hz	
	Other ear operation	None	Other ear operation	None	Other ear operation	None	Other ear operation	None
<u>Both sexes</u>								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	12.9	9.1	8.2	5.8	4.8	1.6	3.5	1.0
12 years	7.1	9.2	4.4	6.4	-1.7	2.0	0.2	1.1
13 years	11.4	9.4	15.0	6.2	16.4	1.7	5.2	1.1
14 years	11.6	8.7	8.0	5.8	5.2	1.6	3.2	1.1
15 years	11.2	9.0	7.0	6.0	1.6	1.5	2.2	1.2
16 years	4.4	9.0	0.8	5.5	-0.6	1.4	0.1	1.0
17 years	21.8	9.2	12.4	5.4	9.4	1.2	7.4	0.8
<u>Boys</u>								
Total, 12-17 years	13.6	9.0	9.3	6.0	5.0	1.8	4.8	1.5
12 years	4.9	9.1	2.6	6.6	-3.5	2.3	0.8	1.8
13 years	12.6	9.2	12.6	6.2	14.4	2.0	7.6	1.6
14 years	7.6	8.7	6.2	6.2	2.8	1.8	0.7	1.4
15 years	11.6	8.9	7.2	6.2	1.2	1.7	-1.2	1.6
16 years	12.5	9.2	2.5	5.8	2.5	1.6	2.5	1.1
17 years	26.0	9.3	17.0	5.3	11.8	1.4	13.2	1.2
<u>Girls</u>								
Total, 12-17 years	12.0	9.2	6.8	5.6	4.4	1.3	1.9	0.6
12 years	9.8	9.4	6.4	6.2	0.4	1.6	-0.6	0.4
13 years	7.5	9.7	22.5	6.0	22.5	1.4	-2.5	0.6
14 years	16.9	8.6	10.3	5.4	8.3	1.2	6.4	0.7
15 years	10.7	9.0	6.9	5.6	2.2	1.3	6.9	0.9
16 years	2.4	9.0	0.4	5.2	-1.4	1.3	-0.5	1.0
17 years	15.5	9.2	5.6	5.4	5.8	0.8	-1.3	0.4
<u>Standard error</u>								
Total, 12-17 years	2.95	0.35	2.05	0.20	1.95	0.20	2.00	0.20
Boys, 12-17 years	4.45	0.35	3.15	0.20	3.15	0.30	2.95	0.25
Girls, 12-17 years	2.75	0.35	1.90	0.20	1.75	0.20	2.30	0.20

Table 25. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without parent-reported other ear operation, by age and sex, with standard errors for total averages: United States, 1966-70—Con.

Age and sex	3000 Hz		4000 Hz		6000 Hz		8000 Hz		Speech	
	Other ear operation	None	Other ear operation	None	Other ear operation	None	Other ear operation	None	Other ear operation	None
Both sexes										
Decibels re audiometric zero (ANSI, 1969)										
Total, 12-17 years . . .	8.0	5.3	10.4	8.0	14.6	11.1	13.1	6.6	7.9	5.0
12 years	4.0	5.2	6.4	8.0	7.4	10.3	6.3	7.0	4.4	5.4
13 years	12.5	5.5	12.4	8.3	13.9	10.9	11.4	7.2	15.1	5.2
14 years	9.4	5.2	9.6	7.6	16.0	10.8	13.4	6.4	7.4	5.0
15 years	1.2	5.6	6.4	8.0	11.2	11.3	16.0	6.8	5.4	5.1
16 years	-0.7	5.3	2.6	8.0	4.3	12.2	-0.2	6.2	0.1	4.8
17 years	13.8	4.9	17.6	7.9	22.6	11.2	20.6	6.2	12.8	4.6
Boys										
Total, 12-17 years . . .	11.0	6.4	12.4	9.2	18.2	12.6	16.0	7.4	9.2	5.3
12 years	3.6	6.4	4.4	9.0	4.4	11.5	4.4	7.8	3.4	5.8
13 years	12.5	6.7	14.1	9.4	16.0	12.0	16.0	8.0	14.4	5.4
14 years	9.6	6.3	7.2	8.6	15.7	12.0	12.4	6.8	5.2	5.4
15 years	0.1	6.8	8.6	9.3	10.2	12.6	20.2	7.5	4.3	5.4
16 years	7.5	6.7	12.5	9.2	12.5	13.9	-2.5	7.4	2.5	5.0
17 years	20.8	5.8	23.1	9.6	32.9	13.6	26.6	6.8	17.6	4.8
Girls										
Total, 12-17 years . . .	4.3	4.1	8.2	6.8	10.2	9.6	9.6	5.9	6.4	4.8
12 years	4.3	4.2	8.8	7.0	11.1	9.0	8.6	6.2	5.6	5.0
13 years	12.5	4.3	7.5	7.2	7.5	9.8	-2.5	6.4	17.5	4.9
14 years	9.1	4.0	12.9	6.8	16.4	9.6	14.6	6.0	10.4	4.7
15 years	2.6	4.4	3.7	6.8	12.7	10.0	10.5	6.0	6.9	4.8
16 years	-2.6	3.8	0.4	6.6	2.4	10.4	0.4	5.0	-0.5	4.6
17 years	3.2	4.0	9.3	6.2	7.0	8.9	11.6	5.6	5.4	4.4
Standard error										
Total, 12-17 years . . .	2.65	0.25	3.05	0.30	3.35	0.35	3.50	0.45	1.90	0.15
Boys, 12-17 years	4.30	0.25	4.95	0.40	5.40	0.45	5.75	0.45	3.05	0.20
Girls, 12-17 years	1.90	0.25	2.05	0.25	2.65	0.25	2.55	0.45	1.65	0.10

Table 26. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without parent-reported other ear trouble, by age and sex, with standard errors for total averages: United States, 1966-70

Age and sex	250 Hz		500 Hz		1000 Hz		2000 Hz	
	Other ear trouble	None	Other ear trouble	None	Other ear trouble	None	Other ear trouble	None
Both sexes								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	9.6	9.2	7.1	5.8	2.8	1.6	1.8	1.0
12 years	9.0	9.2	7.6	6.3	2.8	1.9	3.0	1.0
13 years	11.0	9.4	8.0	6.1	5.0	1.6	3.6	1.0
14 years	9.4	8.7	5.8	5.8	1.8	1.6	0.8	1.2
15 years	10.3	8.9	8.0	5.8	3.3	1.4	1.4	1.2
16 years	9.4	9.0	7.0	5.4	2.2	1.4	2.0	1.0
17 years	7.9	9.5	5.4	5.4	1.0	1.3	-1.3	1.0
Boys								
Total, 12-17 years	8.8	9.1	6.4	6.1	1.8	1.8	1.0	1.6
12 years	5.5	9.2	4.6	6.6	-0.5	2.4	0.8	1.8
13 years	11.1	9.2	8.2	6.2	5.0	2.0	4.0	1.6
14 years	10.6	8.6	6.5	6.2	1.7	1.3	0.4	1.5
15 years	9.5	8.9	7.9	6.1	4.0	1.6	0.9	1.6
16 years	9.6	9.1	6.4	5.8	0.5	1.6	0.5	1.2
17 years	7.8	9.6	5.0	5.6	0.4	1.6	-1.6	1.6
Girls								
Total, 12-17 years	10.2	9.2	7.8	5.6	3.8	1.2	2.6	0.6
12 years	12.8	9.4	11.2	6.0	6.6	1.4	5.5	0.2
13 years	10.9	9.6	7.9	6.0	5.1	1.2	3.4	0.4
14 years	8.4	8.8	5.2	5.4	2.0	1.3	1.2	0.8
15 years	11.0	8.9	8.0	5.6	2.7	1.2	1.9	0.8
16 years	9.2	8.9	7.6	5.1	3.6	1.2	3.3	0.8
17 years	7.9	9.3	5.6	5.4	1.6	0.9	-1.1	0.4
Standard error								
Total, 12-17 years	0.55	0.35	0.50	0.20	0.45	0.25	0.65	0.20
Boys, 12-17 years	0.80	0.35	0.55	0.20	0.60	0.30	0.70	0.25
Girls, 12-17 years	0.60	0.35	0.75	0.20	0.70	0.20	0.90	0.20

Table 26. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without parent-reported other ear trouble, by age and sex, with standard errors for total averages: United States, 1966-70—Con.

Age and sex	3000 Hz		4000 Hz		6000 Hz		8000 Hz		Speech	
	Other ear trouble	None	Other ear trouble	None	Other ear trouble	None	Other ear trouble	None	Other ear trouble	None
Both sexes										
Decibels re audiometric zero (ANSI, 1969)										
Total, 12-17 years	6.0	5.3	9.0	8.0	12.2	11.1	7.7	6.6	6.2	5.0
12 years	6.2	5.2	9.2	7.9	11.4	10.2	7.5	7.0	6.8	5.3
13 years	8.8	5.4	11.6	8.2	14.8	10.8	8.8	7.2	7.6	5.1
14 years	3.7	5.2	8.4	7.6	10.4	10.9	5.6	6.6	5.2	5.1
15 years	6.7	5.5	9.7	7.9	14.7	11.2	8.6	6.8	6.4	5.0
16 years	5.6	5.2	8.2	7.9	11.8	12.2	7.0	6.2	6.0	4.6
17 years	4.6	5.1	6.1	8.1	9.0	11.5	9.0	6.4	4.0	4.8
Boys										
Total, 12-17 years	7.0	6.4	9.8	9.2	12.8	12.6	7.6	7.4	5.6	5.4
12 years	4.9	6.4	8.6	9.0	11.4	11.4	5.3	7.9	4.0	5.8
13 years	11.4	6.6	12.7	9.2	13.8	12.0	10.0	7.9	8.2	5.3
14 years	5.1	6.4	7.6	8.6	12.2	12.0	4.3	6.9	5.6	5.4
15 years	8.5	6.6	12.7	9.1	15.6	12.5	10.0	7.6	6.6	5.3
16 years	6.1	6.7	9.8	9.2	12.6	14.0	7.8	7.3	4.8	5.0
17 years	5.8	6.2	6.7	10.0	10.6	14.0	9.4	7.2	3.9	5.2
Girls										
Total, 12-17 years	5.2	4.0	8.4	6.7	11.7	9.6	7.8	5.8	6.8	4.7
12 years	7.8	4.0	10.0	6.8	11.4	9.0	10.0	6.2	10.0	4.8
13 years	6.4	4.2	10.6	7.1	15.8	9.6	7.6	6.4	7.2	4.8
14 years	2.6	4.2	9.2	6.8	9.0	9.8	6.8	6.2	4.9	4.8
15 years	5.2	4.4	7.0	6.7	13.9	9.8	7.3	6.0	6.3	4.8
16 years	5.1	3.7	6.6	6.6	11.1	10.3	6.1	4.9	7.1	4.4
17 years	3.8	4.0	5.6	6.2	7.7	8.9	8.6	5.5	4.0	4.4
Standard error										
Total, 12-17 years	0.70	0.25	0.75	0.30	0.80	0.35	0.95	0.45	0.55	0.15
Boys, 12-17 years	1.05	0.25	1.20	0.40	1.15	0.45	1.40	0.45	0.55	0.20
Girls, 12-17 years	0.80	0.30	0.95	0.25	1.05	0.25	0.85	0.45	0.85	0.15

Table 27. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without youth-reported hearing trouble, by age and sex, with standard errors for total averages: United States, 1966-70

Age and sex	250 Hz		500 Hz		1000 Hz		2000 Hz	
	Trouble hearing	None	Trouble hearing	None	Trouble hearing	None	Trouble hearing	None
<u>Both sexes</u>								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	14.1	8.9	11.8	5.6	8.2	1.2	7.2	0.8
12 years	16.0	9.0	14.4	6.0	10.1	1.6	6.2	0.9
13 years	15.3	9.2	13.3	5.8	10.1	1.4	9.5	0.8
14 years	12.8	8.4	11.6	5.5	8.4	1.2	7.6	0.6
15 years	14.2	8.7	12.2	5.6	7.2	1.2	6.2	1.0
16 years	14.1	8.8	11.4	5.2	8.2	1.1	8.2	0.6
17 years	13.0	9.2	9.0	5.2	5.8	1.0	5.7	0.6
<u>Boys</u>								
Total, 12-17 years	14.3	8.8	11.6	5.8	8.3	1.5	7.8	1.2
12 years	15.0	8.8	11.7	6.3	8.1	2.0	5.8	1.6
13 years	13.4	9.0	11.1	6.0	9.4	1.7	11.1	1.2
14 years	11.8	8.5	11.6	6.0	9.0	1.4	6.3	1.1
15 years	13.6	8.7	12.0	5.9	6.1	1.4	6.6	1.4
16 years	14.6	8.9	11.0	5.6	9.0	1.3	9.7	0.8
17 years	17.8	9.1	12.4	5.2	8.4	1.2	7.7	1.2
<u>Girls</u>								
Total, 12-17 years	13.8	9.0	12.1	5.4	8.0	1.0	6.6	0.3
12 years	17.1	9.2	18.0	5.8	12.8	1.2	6.7	0.2
13 years	17.2	9.3	15.4	5.6	10.8	1.0	8.0	0.2
14 years	13.9	8.4	11.8	5.0	7.7	1.0	8.8	0.2
15 years	14.6	8.6	12.4	5.2	8.0	0.9	5.8	0.6
16 years	13.7	8.6	11.6	4.8	7.4	1.0	7.0	0.6
17 years	7.6	9.3	5.5	5.4	3.0	0.8	3.4	0.2
<u>Standard error</u>								
Total, 12-17 years	0.70	0.35	0.70	0.20	0.75	0.20	0.60	0.20
Boys, 12-17 years	1.15	0.35	0.90	0.20	0.95	0.25	1.05	0.25
Girls, 12-17 years	0.75	0.35	0.85	0.20	0.95	0.20	1.00	0.20

Table 27. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without youth-reported hearing trouble, by age and sex, with standard errors for total averages: United States, 1966-70—Con.

Age and sex	3000 Hz		4000 Hz		6000 Hz		8000 Hz		Speech	
	Trouble hearing	None	Trouble hearing	None	Trouble hearing	None	Trouble hearing	None	Trouble hearing	None
Both sexes										
Decibels re audiometric zero (ANSI, 1969)										
Total, 12-17 years	12.0	5.0	14.6	7.6	18.8	10.8	15.0	6.2	11.2	4.8
12 years	10.7	5.0	14.2	7.7	18.2	10.0	18.2	6.6	13.0	5.1
13 years	15.8	5.0	17.4	7.9	19.8	10.5	17.2	6.7	12.9	4.8
14 years	10.9	4.8	13.6	7.3	16.8	10.6	13.6	6.0	11.2	4.7
15 years	12.4	5.2	15.8	7.6	18.3	11.0	14.7	6.4	10.6	4.8
16 years	12.6	4.9	13.6	7.6	21.2	11.7	13.0	5.9	11.2	4.4
17 years	10.1	4.8	13.0	7.8	18.8	11.0	14.6	6.0	8.8	4.6
Boys										
Total, 12-17 years	13.8	6.1	17.4	8.8	21.1	12.2	16.8	7.0	11.4	5.0
12 years	11.2	6.1	14.4	8.7	18.8	11.2	18.6	7.3	11.2	5.6
13 years	18.0	6.2	20.2	8.9	23.1	11.5	19.4	7.4	12.8	5.0
14 years	11.2	6.0	13.6	8.2	16.6	11.8	12.2	6.5	11.1	5.0
15 years	14.4	6.3	19.9	8.6	20.6	12.2	19.8	7.0	10.2	5.1
16 years	16.4	6.3	19.0	8.8	24.4	13.4	15.6	7.0	11.8	4.6
17 years	12.7	5.8	18.2	9.4	24.3	13.3	16.6	6.6	11.8	4.8
Girls										
Total, 12-17 years	10.3	3.8	11.7	6.6	16.4	9.3	13.3	5.6	11.0	4.4
12 years	10.1	4.0	13.9	6.7	17.3	8.8	17.8	5.9	15.6	4.6
13 years	13.6	3.8	14.6	6.9	16.4	9.5	15.1	6.0	13.0	4.6
14 years	10.6	3.6	13.8	6.4	17.0	9.2	15.2	5.6	11.4	4.4
15 years	10.8	4.0	12.2	6.4	16.4	9.6	10.3	5.8	11.1	4.5
16 years	9.6	3.4	9.1	6.5	18.5	9.9	10.8	4.6	10.6	4.2
17 years	7.3	3.8	7.2	6.2	12.8	8.7	12.5	5.2	5.6	4.4
Standard error										
Total, 12-17 years	0.95	0.25	0.90	0.30	1.00	0.35	1.10	0.45	0.60	0.15
Boys, 12-17 years	1.60	0.25	1.55	0.35	1.65	0.40	1.75	0.45	0.90	0.15
Girls, 12-17 years	0.90	0.30	1.10	0.25	1.10	0.30	1.05	0.45	0.80	0.15

Table 28. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without youth-reported earaches, by age and sex, with standard errors for total averages: United States, 1966-70

Age and sex	250 Hz		500 Hz		1000 Hz		2000 Hz	
	Earaches	None	Earaches	None	Earaches	None	Earaches	None
<u>Both sexes</u>								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	10.2	8.8	7.2	5.6	3.0	1.2	2.0	0.8
12 years	10.1	9.0	7.5	6.0	3.1	1.6	1.8	0.8
13 years	10.3	9.2	7.0	6.0	2.8	1.4	1.9	0.9
14 years	9.5	8.5	6.7	5.6	2.8	1.2	1.9	0.8
15 years	9.8	8.8	7.7	5.5	3.4	1.0	2.6	0.9
16 years	11.4	8.5	7.7	5.0	3.5	1.0	2.9	0.6
17 years	10.1	9.2	6.2	5.3	2.2	1.1	1.2	0.9
<u>Boys</u>								
Total, 12-17 years	10.1	8.9	7.4	5.8	3.2	1.6	2.4	1.4
12 years	10.0	8.8	7.8	6.2	3.7	1.8	2.6	1.6
13 years	9.9	9.0	7.1	6.0	2.7	1.8	1.8	1.7
14 years	9.6	8.5	7.0	6.1	2.8	1.6	1.7	1.4
15 years	10.0	8.8	7.6	5.9	3.4	1.3	2.8	1.4
16 years	12.2	8.6	8.2	5.4	4.1	1.2	3.5	0.8
17 years	9.0	9.6	6.0	5.5	2.4	1.6	1.8	1.5
<u>Girls</u>								
Total, 12-17 years	10.2	8.8	7.0	5.2	2.8	0.8	1.8	0.2
12 years	10.2	9.2	7.2	5.8	2.6	1.2	1.1	0.1
13 years	10.7	9.4	6.9	5.8	2.8	1.0	2.0	0.1
14 years	9.4	8.5	6.4	5.1	2.9	0.9	2.0	0.3
15 years	9.7	8.8	7.8	5.0	3.4	0.7	2.5	0.4
16 years	10.8	8.4	7.4	4.6	3.2	0.8	2.5	0.4
17 years	10.8	8.8	6.2	5.1	2.2	0.6	1.0	0.2
<u>Standard error</u>								
Total, 12-17 years	0.35	0.35	0.25	0.20	0.30	0.25	0.30	0.20
Boys, 12-17 years	0.55	0.35	0.40	0.20	0.40	0.25	0.35	0.25
Girls, 12-17 years	0.30	0.40	0.30	0.25	0.35	0.20	0.35	0.20

Table 28. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without youth-reported earaches, by age and sex, with standard errors for total averages: United States, 1966-70—Con.

Age and sex	3000 Hz		4000 Hz		6000 Hz		8000 Hz		Speech	
	Earaches	None	Earaches	None	Earaches	None	Earaches	None	Earaches	None
Decibels re audiometric zero (ANSI, 1969)										
Both sexes										
Total, 12-17 years ..	6.0	5.2	8.6	7.8	12.1	10.9	8.1	6.4	6.3	4.8
12 years	6.0	5.0	8.8	7.6	10.9	10.1	8.9	6.4	6.5	5.0
13 years	6.4	5.2	8.7	8.2	12.1	10.6	8.4	6.8	6.1	5.0
14 years	5.4	5.2	7.9	7.6	11.6	10.7	7.4	6.2	6.1	4.8
15 years	6.6	5.3	9.1	7.7	13.2	10.8	8.4	6.4	6.6	4.8
16 years	6.2	5.1	9.0	7.7	13.8	11.8	7.7	5.9	6.8	4.2
17 years	5.0	5.1	8.2	8.0	11.3	11.4	7.3	6.2	5.4	4.6
Boys										
Total, 12-17 years ..	7.3	6.4	9.8	9.0	13.5	12.4	9.2	7.1	6.6	5.1
12 years	7.7	6.0	10.7	8.5	12.1	11.3	10.8	7.0	7.2	5.4
13 years	8.0	6.4	9.2	9.4	13.0	11.8	9.0	7.6	6.2	5.2
14 years	6.2	6.4	8.0	8.6	12.4	12.0	7.0	6.8	6.3	5.2
15 years	7.7	6.5	11.0	8.8	15.0	12.1	10.4	7.1	6.6	5.1
16 years	7.9	6.6	10.4	9.0	16.2	13.6	10.0	7.0	7.6	4.5
17 years	5.9	6.2	9.4	10.0	13.4	14.0	8.1	7.0	5.8	5.0
Girls										
Total, 12-17 years ..	5.0	3.8	7.8	6.4	11.0	9.2	7.2	5.6	6.0	4.4
12 years	4.8	4.0	7.4	6.8	10.0	8.8	7.4	5.9	6.0	4.6
13 years	5.0	4.1	8.2	7.0	11.2	9.4	7.8	6.0	6.0	4.6
14 years	4.8	3.8	7.8	6.6	10.9	9.3	7.8	5.6	5.8	4.4
15 years	5.8	4.0	7.8	6.4	11.8	9.4	6.8	5.8	6.6	4.4
16 years	5.0	3.4	8.0	6.2	12.4	9.8	6.2	4.6	6.4	4.0
17 years	4.4	3.8	7.5	5.8	10.2	8.6	6.8	5.4	5.2	4.2
Standard error										
Total, 12-17 years ..	0.35	0.25	0.30	0.30	0.45	0.30	0.60	0.40	0.20	0.15
Boys, 12-17 years	0.55	0.20	0.50	0.40	0.70	0.45	0.80	0.45	0.25	0.20
Girls, 12-17 years	0.25	0.35	0.25	0.30	0.45	0.25	0.55	0.45	0.30	0.15

Table 29. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without youth-reported ear injury, by age and sex, with standard errors for total averages: United States, 1966-70

Age and sex	250 Hz		500 Hz		1000 Hz		2000 Hz	
	Ear injury	None	Ear injury	None	Ear injury	None	Ear injury	None
<u>Both sexes</u>								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	11.2	9.0	7.9	5.8	4.4	1.4	3.4	0.9
12 years	10.0	9.2	7.4	6.2	3.9	1.8	2.4	1.0
13 years	12.2	9.3	10.3	6.0	6.6	1.4	6.0	0.9
14 years	12.7	8.4	9.5	5.6	6.4	1.2	4.6	0.8
15 years	9.2	9.0	6.0	5.9	2.0	1.4	2.0	1.2
16 years	11.9	8.8	7.0	5.4	4.4	1.2	4.2	0.8
17 years	11.1	9.2	6.6	5.2	2.2	1.0	1.0	0.8
<u>Boys</u>								
Total, 12-17 years	10.2	9.0	7.4	6.0	3.5	1.6	3.6	1.4
12 years	9.8	9.0	7.4	6.4	3.9	2.2	3.6	1.6
13 years	9.6	9.2	7.6	6.2	3.0	1.9	5.2	1.6
14 years	9.9	8.6	9.2	6.0	6.4	1.4	3.6	1.2
15 years	10.9	8.8	6.8	6.2	2.2	1.6	2.8	1.5
16 years	10.3	9.0	5.6	5.7	3.1	1.4	3.5	0.8
17 years	10.7	9.2	7.2	5.2	2.0	1.3	3.0	1.2
<u>Girls</u>								
Total, 12-17 years	12.4	9.0	8.5	5.5	5.4	1.1	3.2	0.4
12 years	10.4	9.4	7.4	6.0	3.9	1.4	0.9	0.2
13 years	14.9	9.4	13.2	5.7	10.4	1.0	6.8	0.2
14 years	15.1	8.3	9.8	5.1	6.6	1.0	5.4	0.2
15 years	6.9	9.0	4.8	5.6	1.9	1.2	0.7	1.0
16 years	13.6	8.6	8.4	5.0	5.7	1.0	4.9	0.7
17 years	11.6	9.2	5.8	5.4	2.4	0.8	-1.4	0.4
<u>Standard error</u>								
Total, 12-17 years	0.65	0.35	0.60	0.20	0.60	0.20	0.55	0.25
Boys, 12-17 years	0.80	0.35	0.80	0.20	0.85	0.30	0.90	0.30
Girls, 12-17 years	0.90	0.35	0.80	0.20	1.00	0.20	0.90	0.20

Table 29. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without youth-reported ear injury, by age and sex, with standard errors for total averages: United States, 1966-70—Con.

Age and sex	3000 Hz		4000 Hz		6000 Hz		8000 Hz		Speech	
	Ear injury	None	Ear injury	None	Ear injury	None	Ear injury	None	Ear injury	None
Decibels re audiometric zero (ANSI, 1969)										
<u>Both sexes</u>										
Total, 12-17 years	8.4	5.1	11.8	7.8	15.4	10.8	10.2	6.4	7.4	4.8
12 years	7.6	5.1	10.2	7.8	11.7	10.2	8.2	6.8	7.2	5.2
13 years	12.2	5.2	15.6	8.0	18.3	10.6	15.2	6.8	9.8	4.9
14 years	8.3	5.0	12.0	7.3	16.7	10.4	11.4	6.1	8.8	4.8
15 years	7.6	5.4	10.0	7.9	14.6	11.2	6.0	6.8	5.5	5.1
16 years	8.1	5.0	11.6	7.7	16.6	11.8	10.7	5.9	7.3	4.5
17 years	6.2	4.9	10.6	7.8	14.8	11.1	9.0	6.1	4.9	4.6
<u>Boys</u>										
Total, 12-17 years	9.2	6.2	12.6	8.9	16.7	12.3	9.8	7.2	6.8	5.2
12 years	8.8	6.2	12.4	8.8	13.2	11.4	7.0	7.7	7.5	5.6
13 years	13.2	6.4	16.2	9.0	21.6	11.5	17.0	7.4	7.6	5.3
14 years	8.2	6.2	11.0	8.2	16.3	11.8	9.0	6.6	8.0	5.2
15 years	8.5	6.6	10.6	9.2	15.2	12.4	6.6	7.6	6.2	5.3
16 years	9.4	6.4	11.8	9.0	15.4	13.6	10.4	7.1	6.0	4.8
17 years	7.4	5.8	13.2	9.4	18.6	13.3	9.0	6.7	5.6	4.8
<u>Girls</u>										
Total, 12-17 years	7.4	3.9	10.8	6.6	14.1	9.4	10.6	5.6	8.0	4.6
12 years	6.1	4.0	7.8	6.8	9.9	9.0	9.5	6.0	7.0	4.8
13 years	11.1	4.0	15.0	6.9	14.8	9.5	13.1	6.0	12.4	4.5
14 years	8.4	3.6	12.9	6.3	17.0	9.0	13.5	5.6	9.5	4.4
15 years	6.2	4.2	9.1	6.6	13.8	9.8	5.1	6.0	4.6	4.8
16 years	6.6	3.6	11.2	6.4	17.7	10.0	11.0	4.6	8.6	4.3
17 years	4.7	4.0	7.6	11.2	10.2	9.0	8.9	5.6	4.1	4.4
<u>Standard error</u>										
Total, 12-17 years	0.75	0.25	0.70	0.30	0.85	0.30	0.75	0.45	0.50	0.15
Boys, 12-17 years	1.30	0.25	1.40	0.40	1.25	0.45	1.10	0.50	0.75	0.20
Girls, 12-17 years	0.95	0.25	1.20	0.25	1.35	0.25	1.60	0.45	0.85	0.15

Table 30. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without youth-reported other ear trouble, by age and sex, with standard errors for total averages: United States, 1966-70

Age and sex	250 Hz		500 Hz		1000 Hz		2000 Hz	
	Other ear trouble	None	Other ear trouble	None	Other ear trouble	None	Other ear trouble	None
Both sexes								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	10.2	9.0	6.5	5.8	2.6	1.5	1.7	1.0
12 years	9.2	9.2	6.3	6.4	2.6	1.9	1.5	1.0
13 years	9.4	9.4	6.2	6.2	2.6	1.6	1.8	1.1
14 years	9.6	8.6	6.7	5.8	3.1	1.4	2.1	1.0
15 years	10.4	8.8	6.0	5.9	1.4	1.5	2.0	1.2
16 years	10.6	8.9	7.2	5.4	3.0	1.3	1.6	1.0
17 years	11.2	9.2	6.4	5.4	2.8	1.1	1.2	0.9
Boys								
Total, 12-17 years	10.4	9.0	6.6	6.0	2.9	1.8	2.5	1.4
12 years	9.0	9.0	5.9	6.6	2.6	2.2	2.7	1.7
13 years	10.6	9.1	7.6	6.2	3.7	1.9	4.0	1.5
14 years	9.1	8.7	6.8	6.2	3.6	1.6	2.3	1.4
15 years	10.4	8.8	5.6	6.2	1.4	1.6	2.4	1.5
16 years	12.1	8.9	7.7	5.6	3.1	1.5	2.1	1.1
17 years	11.5	9.4	6.6	5.4	3.0	1.5	1.9	1.5
Girls								
Total, 12-17 years	9.8	9.1	6.4	5.6	2.2	1.2	0.8	0.6
12 years	9.6	9.4	6.8	6.2	2.6	1.6	-0.1	0.4
13 years	8.0	9.8	4.8	6.2	1.4	1.4	-0.4	0.6
14 years	10.4	8.6	6.6	5.4	2.4	1.3	1.8	0.6
15 years	10.4	8.8	6.5	5.6	1.4	1.3	1.6	0.8
16 years	9.5	8.8	6.8	5.0	2.9	1.1	1.2	0.8
17 years	10.8	9.1	6.3	5.2	2.6	0.8	0.2	0.4
Standard error								
Total, 12-17 years	0.55	0.35	0.45	0.20	0.40	0.25	0.40	0.20
Boys, 12-17 years	0.75	0.35	0.55	0.25	0.55	0.30	0.50	0.25
Girls, 12-17 years	0.65	0.35	0.50	0.20	0.45	0.20	0.60	0.20

Table 30. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years with and without youth-reported other ear trouble, by age and sex, with standard errors for total averages: United States, 1966-70—Con.

Age and sex	3000 Hz		4000 Hz		6000 Hz		8000 Hz		Speech	
	Other ear trouble	None	Other ear trouble	None	Other ear trouble	None	Other ear trouble	None	Other ear trouble	None
<u>Both sexes</u>										
Decibels re audiometric zero (ANSI, 1969)										
Total, 12-17 years	6.4	5.2	9.6	7.8	13.4	11.0	8.9	6.5	5.8	5.0
12 years	5.8	5.2	9.2	7.8	11.8	10.2	9.8	6.8	5.8	5.4
13 years	5.8	5.5	9.3	8.3	13.2	10.8	7.2	7.2	5.8	5.2
14 years	6.2	5.2	8.3	7.6	12.6	10.8	7.4	6.4	6.2	5.0
15 years	6.6	5.4	9.0	7.9	13.8	11.1	9.2	6.6	5.5	5.1
16 years	7.0	5.1	10.8	7.6	15.4	11.8	9.6	5.9	6.2	4.6
17 years	6.6	5.0	10.6	7.8	13.4	11.2	9.7	6.1	5.7	4.7
<u>Boys</u>										
Total, 12-17 years	7.8	6.4	11.3	9.0	14.9	12.4	10.0	7.2	6.4	5.2
12 years	6.6	6.2	10.5	8.8	11.9	11.4	9.0	7.6	6.0	5.8
13 years	8.8	6.6	12.1	9.2	15.0	11.8	7.7	8.0	7.4	5.3
14 years	7.2	6.2	8.0	8.6	12.8	12.0	7.6	6.8	6.5	5.3
15 years	6.9	6.6	10.0	9.2	13.5	12.6	10.4	7.4	5.5	5.4
16 years	9.6	6.5	15.2	8.7	20.0	13.4	14.2	6.8	6.9	4.8
17 years	8.4	6.0	12.8	9.6	16.8	13.6	11.2	6.7	6.3	5.0
<u>Girls</u>										
Total, 12-17 years	4.6	4.0	7.6	6.7	11.8	9.4	7.7	5.8	5.2	4.7
12 years	4.8	4.1	7.6	6.9	11.7	8.8	11.0	6.0	5.4	4.9
13 years	2.6	4.4	6.3	7.4	11.4	9.7	6.6	6.4	4.0	5.0
14 years	4.5	4.0	8.8	6.8	12.5	9.6	7.0	6.0	5.8	4.7
15 years	6.3	4.2	8.1	6.6	14.1	9.6	8.2	5.8	5.5	4.8
16 years	4.8	3.6	7.4	6.6	11.8	10.2	6.0	4.9	5.6	4.4
17 years	4.1	4.0	7.4	6.1	8.6	9.0	7.5	5.5	4.8	4.4
<u>Standard error</u>										
Total, 12-17 years	0.50	0.25	0.65	0.30	0.70	0.35	0.85	0.45	0.35	0.15
Boys, 12-17 years	0.70	0.25	1.10	0.40	0.95	0.45	1.25	0.45	0.50	0.20
Girls, 12-17 years	0.55	0.25	0.50	0.25	0.85	0.25	0.80	0.45	0.50	0.10

Table 31. Average hearing levels at each test frequency among youths aged 12-17 years with normal and abnormal conditions of the right and left external ear, by age and sex, with standard errors for total averages: United States, 1966-70

Ear, age, and sex	250 Hz		500 Hz		1000 Hz		2000 Hz	
	Normal	Abnormal	Normal	Abnormal	Normal	Abnormal	Normal	Abnormal
RIGHT EAR								
<u>Both sexes</u>								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	10.6	15.0	7.5	11.8	3.4	7.5	3.2	7.4
12 years	10.8	14.9	7.8	12.8	3.8	6.6	3.0	4.6
13 years	11.0	17.2	7.9	10.6	3.4	6.8	3.0	10.6
14 years	10.4	12.4	7.8	10.4	3.5	5.6	3.4	4.4
15 years	10.4	17.7	7.6	16.1	3.2	13.1	3.4	11.2
16 years	10.4	8.5	7.0	6.1	3.1	-1.2	3.2	7.0
17 years	10.6	15.0	6.8	10.7	3.0	8.0	3.0	4.0
<u>Boys</u>								
Total, 12-17 years	10.6	15.7	7.7	14.4	3.5	9.4	3.4	8.5
<u>Girls</u>								
Total, 12-17 years	10.6	14.6	7.3	10.3	3.3	6.3	2.9	6.7
Standard error of average, total	0.30	1.50	0.20	1.70	0.25	1.85	0.20	1.75
LEFT EAR								
<u>Both sexes</u>								
Total, 12-17 years	11.8	12.7	7.9	9.4	3.9	4.7	3.6	4.6
12 years	11.6	13.0	8.4	9.5	4.4	5.8	3.8	8.2
13 years	12.0	19.4	8.2	14.8	4.2	11.8	4.0	7.1
14 years	11.2	9.1	8.0	9.3	3.8	4.6	3.4	-0.2
15 years	11.8	12.9	7.9	9.8	3.8	5.8	3.8	4.8
16 years	11.8	9.6	7.2	7.3	3.8	-1.8	3.6	4.2
17 years	12.0	13.4	7.6	4.6	3.6	1.0	3.4	4.4
<u>Boys</u>								
Total, 12-17 years	11.6	11.9	8.2	10.6	4.3	6.1	4.4	6.7
<u>Girls</u>								
Total, 12-17 years	11.8	13.2	7.6	8.8	3.5	3.8	3.0	3.4
Standard error of average, total	0.40	1.60	0.25	1.40	0.25	1.60	0.20	1.50

Table 31. Average hearing levels at each test frequency among youths aged 12-17 years with normal and abnormal conditions of the right and left external ear, by age and sex, with standard errors for total averages: United States, 1966-70—Con.

Ear, age, and sex	3000 Hz		4000 Hz		6000 Hz		8000 Hz	
	Normal	Abnormal	Normal	Abnormal	Normal	Abnormal	Normal	Abnormal
RIGHT EAR								
Decibels re audiometric zero (ANSI, 1969)								
<u>Both sexes</u>								
Total, 12-17 years	7.4	12.0	10.2	15.3	14.2	21.3	10.1	16.8
12 years	7.2	13.5	9.9	17.7	13.2	18.4	10.0	17.0
13 years	7.6	12.2	10.4	19.2	14.0	17.8	10.5	14.4
14 years	7.3	8.4	10.2	10.8	14.0	23.0	9.8	16.6
15 years	7.7	16.0	10.2	17.8	14.4	24.8	10.4	19.4
16 years	7.4	9.2	10.3	13.6	15.3	21.0	10.0	11.0
17 years	7.2	10.0	10.2	8.9	14.5	22.0	10.0	20.2
<u>Boys</u>								
Total, 12-17 years	8.4	13.3	11.4	18.4	16.0	26.3	11.2	22.0
<u>Girls</u>								
Total, 12-17 years	6.4	11.3	9.0	13.4	12.4	18.2	9.0	13.8
Standard error of average, total	0.25	2.25	0.25	2.45	0.40	2.00	0.50	2.60
LEFT EAR								
<u>Both sexes</u>								
Total, 12-17 years	8.2	10.4	11.8	13.8	15.4	19.7	10.4	12.8
12 years	8.1	16.8	11.6	20.1	14.6	21.8	11.2	17.0
13 years	8.6	14.2	12.0	18.5	15.2	24.4	11.1	17.0
14 years	8.1	6.6	11.6	9.4	15.0	21.0	10.0	15.6
15 years	8.4	10.1	11.8	14.4	15.8	17.4	10.4	9.4
16 years	8.0	6.8	12.0	8.4	16.4	17.2	9.8	9.6
17 years	7.9	8.4	12.0	12.6	16.1	15.9	10.0	8.2
<u>Boys</u>								
Total, 12-17 years	9.8	13.2	13.5	17.0	17.3	22.2	11.6	14.2
<u>Girls</u>								
Total, 12-17 years	6.6	8.8	10.2	11.9	13.6	18.2	9.2	12.0
Standard error of average, total	0.25	1.70	0.35	1.95	0.40	1.65	0.40	1.75

Table 32. Average hearing levels in the right ear at each test frequency among youths aged 12-17 years with normal and abnormal conditions of the right and left auditory canal, by age and sex, with standard errors for total averages: United States, 1966-70

Ear, age, and sex	250 Hz		500 Hz		1000 Hz		2000 Hz	
	Normal	Abnormal	Normal	Abnormal	Normal	Abnormal	Normal	Abnormal
RIGHT EAR								
Both sexes								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	10.6	11.5	7.4	8.4	3.2	4.6	3.0	5.4
12 years	10.6	12.7	7.5	10.4	3.6	6.0	2.7	5.6
13 years	11.0	11.6	7.8	8.8	3.2	5.0	2.8	5.2
14 years	10.3	11.6	7.7	8.4	3.4	4.2	3.2	6.0
15 years	10.4	11.0	7.6	7.8	3.2	4.6	3.2	5.8
16 years	10.4	10.6	7.0	7.6	3.0	4.4	3.0	5.1
17 years	10.6	11.4	6.8	7.0	3.0	3.4	2.8	4.8
Boys								
Total, 12-17 years	10.6	11.0	7.6	8.3	3.4	4.4	3.2	5.6
Girls								
Total, 12-17 years	10.5	12.0	7.2	8.6	3.1	5.0	2.6	5.4
Standard error of average, total	0.30	0.50	0.20	0.45	0.20	0.45	0.20	0.40
LEFT EAR								
Both sexes								
Total, 12-17 years	11.8	12.0	7.8	8.6	3.8	4.6	3.4	5.5
12 years	11.6	11.6	8.3	9.0	4.2	5.2	3.5	5.6
13 years	12.2	12.0	8.2	9.2	4.2	4.9	3.8	5.8
14 years	11.2	11.3	8.0	7.8	3.8	3.0	3.2	5.0
15 years	11.8	12.2	7.8	8.9	3.7	4.8	3.6	5.6
16 years	11.7	12.4	7.2	8.0	3.6	5.0	3.4	5.4
17 years	12.0	12.3	7.6	7.8	3.4	4.4	3.2	5.5
Boys								
Total, 12-17 years	11.6	11.9	8.1	8.8	4.3	4.7	4.1	6.2
Girls								
Total, 12-17 years	11.8	12.0	7.6	8.2	3.4	4.4	2.7	4.8
Standard error of average, total	0.40	0.55	0.25	0.30	0.25	0.40	0.20	0.40

Table 32. Average hearing levels in the right ear at each test frequency among youths aged 12-17 years with normal and abnormal conditions of the right and left auditory canal, by age and sex, with standard errors for total averages: United States, 1966-70—Con.

Ear, age, and sex	3000 Hz		4000 Hz		6000 Hz		8000 Hz	
	Normal	Abnormal	Normal	Abnormal	Normal	Abnormal	Normal	Abnormal
RIGHT EAR								
<u>Both sexes</u>								
Total, 12-17 years	7.1	10.0	10.1	11.4	14.1	15.6	9.9	12.3
12 years	6.8	10.2	9.8	11.1	13.0	14.6	9.8	11.2
13 years	7.3	9.8	10.4	11.6	14.0	14.4	10.4	11.4
14 years	7.0	10.4	10.0	12.0	13.8	17.1	9.6	13.2
15 years	7.5	9.8	10.0	12.1	14.2	16.2	10.2	12.4
16 years	7.0	10.0	10.2	11.2	15.2	16.4	9.6	12.2
17 years	7.0	9.2	10.2	10.0	14.4	15.7	9.7	14.0
<u>Boys</u>								
Total, 12-17 years	8.2	10.6	11.4	12.0	16.0	16.3	11.1	12.9
<u>Girls</u>								
Total, 12-17 years	6.0	9.3	8.8	10.8	12.1	15.0	8.6	11.7
Standard error of average, total	0.20	0.60	0.25	0.50	0.40	0.50	0.50	0.65
LEFT EAR								
<u>Both sexes</u>								
Total, 12-17 years	8.0	9.8	11.8	12.4	15.5	15.7	10.0	12.0
12 years	8.0	9.4	11.6	12.2	14.6	15.0	9.8	11.3
13 years	8.4	10.0	12.0	12.2	15.2	15.5	10.4	11.8
14 years	7.9	9.9	11.6	11.6	15.0	15.6	9.6	12.6
15 years	8.4	9.0	11.8	12.5	15.8	15.5	10.5	10.8
16 years	7.6	10.9	11.8	13.7	16.4	16.8	9.5	13.6
17 years	7.7	9.4	12.0	12.1	16.1	16.2	9.8	12.6
<u>Boys</u>								
Total, 12-17 years	9.6	11.2	13.5	13.4	17.4	17.4	11.2	12.2
<u>Girls</u>								
Total, 12-17 years	6.4	8.3	10.0	11.3	13.6	14.0	8.6	11.8
Standard error of average, total	0.20	0.55	0.30	0.65	0.40	0.45	0.50	0.60

Table 33. Average hearing levels at each test frequency among youths aged 12-17 years with partial or complete occlusion of the right and left auditory canal, by age, sex, and degree of occlusion, with standard errors for total averages: United States, 1966-70

Ear, age, and sex	250 Hz			500 Hz			1000 Hz			2000 Hz		
	Total occluded	Partially	Completely	Total occluded	Partially	Completely	Total occluded	Partially	Completely	Total occluded	Partially	Completely
RIGHT EAR												
<u>Both sexes</u>												
Decibels re audiometric zero (ANSI, 1969)												
Total, 12-17 years	11.4	10.8	11.8	8.3	7.6	8.9	4.6	3.8	5.1	5.4	4.0	6.6
12 years	12.6	12.3	13.0	10.4	9.8	11.1	5.9	5.8	5.9	5.7	5.5	5.8
13 years	11.6	10.7	12.5	8.7	7.6	9.8	5.0	4.0	5.8	5.1	2.6	7.4
14 years	11.2	13.0	9.6	8.2	9.2	7.6	4.0	4.8	3.3	6.0	6.1	6.0
15 years	11.0	9.0	12.8	7.6	5.8	9.4	4.4	3.2	5.6	5.6	4.3	6.8
16 years	10.6	9.7	11.4	7.4	6.9	7.9	4.4	2.8	5.7	5.3	1.8	8.0
17 years	10.9	10.4	11.2	6.4	5.2	7.0	2.9	1.3	3.8	4.5	3.0	5.4
<u>Boys</u>												
Total, 12-17 years	11.0	11.0	11.0	8.2	8.4	8.1	4.3	4.1	4.4	5.6	4.3	6.6
<u>Girls</u>												
Total, 12-17 years	11.8	10.7	12.8	8.4	6.8	9.8	4.8	3.6	5.8	5.2	3.7	6.6
Standard error of average, total	0.50	0.70	0.55	0.45	0.50	0.55	0.50	0.65	0.60	0.45	0.60	0.50
LEFT EAR												
<u>Both sexes</u>												
Total, 12-17 years	12.0	11.4	12.5	8.6	8.1	9.0	4.5	4.0	5.0	5.6	4.6	6.6
12 years	11.6	10.8	12.4	9.0	8.2	9.8	4.9	4.6	5.3	5.7	5.0	6.6
13 years	12.0	12.4	11.7	9.2	8.6	9.8	4.9	4.4	5.3	6.0	4.8	7.2
14 years	11.2	11.6	10.8	7.8	8.0	7.7	3.0	3.6	2.4	5.0	5.0	4.9
15 years	12.2	10.3	13.8	9.0	7.8	10.0	4.8	3.6	5.8	5.7	3.3	7.8
16 years	12.4	11.5	13.4	8.0	7.9	8.2	4.8	4.8	4.9	5.6	5.4	5.8
17 years	12.4	12.0	12.7	7.9	8.0	7.8	4.4	2.5	5.8	5.6	4.3	6.7
<u>Boys</u>												
Total, 12-17 years	11.8	11.7	12.0	8.8	8.8	8.9	4.6	4.1	5.1	6.4	5.0	7.5
<u>Girls</u>												
Total, 12-17 years	12.0	11.2	13.2	8.2	7.6	9.0	4.3	4.0	4.8	4.8	4.4	5.4
Standard error of average, total	0.55	0.70	0.60	0.30	0.30	0.45	0.45	0.50	0.60	0.40	0.55	0.40

Table 33. Average hearing levels at each test frequency among youths aged 12-17 years with partial or complete occlusion of the right and left auditory canal, by age, sex, and degree of occlusion, with standard errors for total averages: United States, 1966-70—Con.

Ear, age, and sex	3000 Hz			4000 Hz			6000 Hz			8000 Hz		
	Total occluded	Partially	Completely	Total occluded	Partially	Completely	Total occluded	Partially	Completely	Total occluded	Partially	Completely
RIGHT EAR												
<u>Both sexes</u>												
Decibels re audiometric zero (ANSI, 1969)												
Total, 12-17 years	9.8	8.4	10.9	11.2	10.8	11.4	15.4	15.0	15.7	12.1	10.4	13.5
12 years	10.2	10.4	10.0	11.1	12.8	9.6	14.6	16.2	13.2	11.2	11.6	10.8
13 years	9.8	8.8	10.8	11.7	10.8	12.5	14.4	13.8	15.0	11.4	9.8	12.8
14 years	10.2	8.7	11.5	11.3	10.8	11.8	16.4	18.0	15.2	12.6	11.2	13.6
15 years	9.6	9.0	10.2	11.6	11.2	12.0	15.6	15.2	15.9	12.0	10.7	13.4
16 years	10.0	7.4	12.1	11.3	10.0	12.4	16.4	13.4	18.9	12.4	8.1	15.8
17 years	8.6	4.4	11.0	9.6	7.5	10.9	15.2	13.3	16.4	13.6	10.8	15.4
<u>Boys</u>												
Total, 12-17 years	10.6	9.9	11.0	11.9	12.3	11.6	16.1	16.8	15.6	12.8	12.0	13.5
<u>Girls</u>												
Total, 12-17 years	9.0	7.2	10.8	10.4	9.6	11.4	14.7	13.6	15.8	11.4	9.1	13.6
Standard error of average, total	0.55	0.65	0.55	0.45	0.70	0.55	0.40	0.65	0.65	0.65	0.80	0.80
LEFT EAR												
<u>Both sexes</u>												
Total, 12-17 years	9.7	8.8	10.6	12.3	12.0	12.6	15.6	14.8	16.4	11.8	10.6	13.0
12 years	9.2	8.2	10.6	12.0	11.4	12.6	14.8	14.4	15.5	13.0	13.0	13.0
13 years	10.2	10.3	10.0	12.2	11.8	12.6	15.5	14.8	16.2	12.1	11.1	13.0
14 years	9.8	9.8	9.8	11.4	12.6	10.2	15.4	16.4	14.6	9.6	10.6	8.7
15 years	9.1	7.0	11.0	12.5	11.0	13.8	15.4	14.8	16.0	10.4	8.4	12.2
16 years	10.7	9.8	11.6	13.7	13.8	13.6	16.7	15.6	17.7	13.3	10.6	16.1
17 years	9.4	7.6	10.8	12.2	11.6	12.6	16.4	13.2	18.7	12.4	8.0	15.6
<u>Boys</u>												
Total, 12-17 years	11.1	10.0	11.9	13.4	12.8	13.8	17.3	16.6	17.8	13.0	11.4	14.2
<u>Girls</u>												
Total, 12-17 years	8.3	7.8	9.0	11.2	11.4	11.1	14.0	13.4	14.6	10.7	9.8	11.6
Standard error of average, total	0.55	0.75	0.55	0.65	0.80	0.80	0.40	0.55	0.65	0.60	0.70	0.75

Table 34. Average hearing levels in the right ear at each test frequency among youths aged 12-17 years with normal and abnormal conditions of the right drum, by age and sex, with standard errors for total averages: United States, 1966-70

Ear, age, and sex	250 Hz			500 Hz			1000 Hz			2000 Hz		
	Normal	Abnormal	Not visible	Normal	Abnormal	Not visible	Normal	Abnormal	Not visible	Normal	Abnormal	Not visible
RIGHT EAR												
<u>Both sexes</u>												
Decibels re audiometric zero (ANSI, 1969)												
Total, 12-17 years . . .	10.3	12.8	11.7	7.2	10.0	8.8	3.0	6.2	5.0	2.8	5.1	6.1
12 years	10.2	13.4	13.6	7.2	10.6	11.6	3.3	6.4	6.6	2.6	4.2	6.0
13 years	10.6	14.0	12.0	7.5	11.0	9.0	3.0	7.3	4.8	2.6	5.0	6.6
14 years	10.2	12.8	9.6	7.4	10.4	7.4	3.2	6.6	3.2	3.0	6.0	5.6
15 years	10.2	12.3	12.0	7.2	10.2	8.8	2.8	6.2	5.4	2.8	6.4	6.4
16 years	10.0	13.0	10.8	6.8	9.3	7.4	2.6	5.7	5.0	2.8	4.9	6.6
17 years	10.5	11.6	11.4	6.6	8.1	7.4	2.8	4.6	4.0	2.6	4.0	5.2
<u>Boys</u>												
Total, 12-17 years . . .	10.2	13.4	11.0	7.3	10.8	8.3	3.0	7.2	4.5	2.9	6.2	6.2
<u>Girls</u>												
Total, 12-17 years . . .	10.4	12.2	12.4	7.0	9.0	9.2	3.0	5.0	5.4	2.6	3.9	5.9
Standard error of average, total	0.30	0.55	0.45	0.20	0.50	0.55	0.20	0.55	0.50	0.20	0.50	0.40
LEFT EAR												
<u>Both sexes</u>												
Total, 12-17 years . . .	11.4	13.8	12.4	7.6	9.9	9.0	3.5	6.6	4.9	3.2	5.3	6.4
12 years	11.2	14.0	13.0	7.8	11.1	10.4	3.8	8.0	5.8	3.2	5.8	6.6
13 years	11.8	15.2	12.2	7.8	11.4	9.8	3.8	8.6	5.3	3.4	6.2	7.6
14 years	11.0	13.8	10.7	7.7	10.3	7.6	3.4	6.6	2.6	3.0	5.5	5.0
15 years	11.5	12.6	13.2	7.7	8.2	9.8	3.5	5.0	5.4	3.4	4.2	7.0
16 years	11.4	14.8	12.7	6.8	10.3	7.8	3.2	7.4	4.6	3.0	6.2	5.5
17 years	11.9	12.3	12.7	7.4	8.3	8.0	3.2	4.4	5.3	3.1	3.9	6.3
<u>Boys</u>												
Total, 12-17 years . . .	11.3	14.0	12.0	7.8	10.4	9.0	3.9	7.2	5.0	3.8	6.3	7.4
<u>Girls</u>												
Total, 12-17 years . . .	11.6	13.5	13.0	7.3	9.4	9.2	3.1	6.0	4.8	2.6	4.3	5.4
Standard error of average, total	0.40	0.65	0.50	0.20	0.65	0.45	0.25	0.60	0.60	0.20	0.40	0.40

Table 34. Average hearing levels in the right ear at each test frequency among youths aged 12-17 years with normal and abnormal conditions of the right drum, by age and sex, with standard errors for total averages: United States, 1966-70—Con.

Ear, age, and sex	3000 Hz			4000 Hz			6000 Hz			8000 Hz		
	Normal	Abnormal	Not visible	Normal	Abnormal	Not visible	Normal	Abnormal	Not visible	Normal	Abnormal	Not visible
RIGHT EAR												
Both sexes												
Decibels re audiometric zero (ANSI, 1969)												
Total, 12-17 years . . .	6.9	9.5	10.6	9.7	13.7	11.4	13.6	18.4	15.5	9.4	14.0	13.0
12 years	6.8	8.6	10.8	9.3	14.4	11.1	12.6	18.3	14.2	9.2	15.8	11.6
13 years	7.0	10.4	10.5	10.0	14.2	11.7	13.6	18.6	14.4	9.9	15.0	12.2
14 years	6.6	10.6	11.2	9.7	13.0	11.4	13.4	18.4	15.4	9.2	13.8	12.8
15 years	7.2	10.6	10.0	9.5	15.6	11.3	13.6	19.6	15.8	9.6	15.8	12.4
16 years	7.0	8.1	11.0	9.9	12.6	11.8	14.8	18.3	17.7	9.4	11.0	14.6
17 years	6.8	8.4	10.6	9.8	12.1	10.6	14.2	16.9	16.0	9.4	11.8	15.2
Boys												
Total, 12-17 years . . .	7.8	11.4	11.0	10.8	16.2	11.8	15.4	21.4	15.6	10.4	16.7	13.4
Girls												
Total, 12-17 years . . .	6.0	7.4	10.2	8.6	11.0	10.8	11.8	15.1	15.4	8.5	11.0	12.7
Standard error of average, total	0.25	0.65	0.45	0.25	0.50	0.40	0.35	0.75	0.60	0.45	0.95	0.75
LEFT EAR												
Both sexes												
Total, 12-17 years . . .	7.8	10.3	10.5	11.4	14.4	12.6	15.0	19.2	16.1	9.8	14.0	12.8
12 years	7.7	10.0	11.2	11.1	15.2	13.0	14.1	18.2	15.6	10.4	15.7	14.2
13 years	8.0	12.3	10.3	11.6	15.4	13.2	14.6	20.3	16.6	10.4	15.8	13.3
14 years	7.6	10.9	9.8	11.2	14.6	10.6	14.8	17.4	14.2	9.6	14.3	9.0
15 years	8.1	9.9	10.4	11.4	14.1	12.9	15.3	19.8	15.4	10.0	12.6	11.2
16 years	7.5	10.6	10.6	11.6	13.8	13.8	15.9	20.6	16.6	9.0	13.4	14.2
17 years	7.6	8.2	10.6	11.9	13.0	12.0	15.6	19.3	18.2	9.2	12.4	14.8
Boys												
Total, 12-17 years . . .	9.3	12.4	11.8	13.0	17.4	13.7	16.8	21.5	17.6	11.0	16.0	14.1
Girls												
Total, 12-17 years . . .	6.2	8.2	9.0	9.9	11.4	11.4	13.2	17.0	14.2	8.6	12.0	11.4
Standard error of average, total	0.25	0.40	0.50	0.30	0.45	0.70	0.40	0.65	0.55	0.35	0.75	0.80

Table 35. Average hearing levels at each test frequency among youths aged 12-17 years, by mobility of the drum of the right and left ear, age, and sex, with standard errors for total averages: United States, 1966-70

Ear, age, and sex	250 Hz			500 Hz			1000 Hz			2000 Hz		
	Yes	No	Pneumatic otoscopy unsatisfactory	Yes	No	Pneumatic otoscopy unsatisfactory	Yes	No	Pneumatic otoscopy unsatisfactory	Yes	No	Pneumatic otoscopy unsatisfactory
RIGHT EAR												
<u>Both sexes</u>												
Decibels re audiometric zero (ANSI, 1969)												
Total, 12-17 years	10.4	16.0	11.8	7.4	11.8	8.8	3.2	8.0	4.8	2.9	7.7	6.0
12 years	10.5	18.2	13.2	7.5	15.3	11.2	3.5	12.3	6.6	2.8	7.8	5.6
13 years	10.9	16.6	11.8	7.8	14.2	8.6	3.3	9.8	4.5	2.8	6.6	6.0
14 years	10.3	16.3	10.3	7.7	10.2	7.8	3.4	8.4	3.3	3.2	6.7	6.1
15 years	10.4	11.9	12.2	7.5	9.8	9.0	3.2	5.2	4.9	3.2	8.1	6.4
16 years	10.1	16.2	11.7	6.8	12.0	8.0	2.8	8.2	4.9	2.8	9.7	6.5
17 years	10.4	18.4	11.4	6.6	10.4	7.6	3.0	4.2	4.0	2.8	7.4	5.1
<u>Boys</u>												
Total, 12-17 years	10.4	17.6	11.2	7.6	14.2	8.2	3.3	10.3	4.2	3.1	10.8	6.2
<u>Girls</u>												
Total, 12-17 years	10.4	14.2	12.5	7.2	8.9	9.4	3.1	5.2	5.3	2.7	4.0	5.7
Standard error of average, total	0.30	1.35	0.50	0.20	1.40	0.55	0.20	1.70	0.60	0.20	1.05	0.40
LEFT EAR												
<u>Both sexes</u>												
Total, 12-17 years	11.6	18.2	12.7	7.6	14.3	9.2	3.7	10.2	5.0	3.4	8.0	6.3
12 years	11.3	20.8	13.6	7.9	19.6	11.1	4.0	12.9	6.6	3.4	9.4	6.8
13 years	12.0	18.7	12.4	8.0	14.0	9.6	4.1	10.2	5.2	3.6	7.0	7.1
14 years	11.2	16.7	11.0	7.8	12.7	8.2	3.7	9.0	3.2	3.2	5.6	5.0
15 years	11.6	17.6	12.7	7.8	11.6	9.2	3.7	8.7	4.4	3.4	9.4	6.5
16 years	11.5	19.6	13.0	7.0	16.4	7.8	3.4	14.1	5.2	3.2	11.9	6.0
17 years	11.8	15.6	13.3	7.4	10.6	8.8	3.4	4.8	5.5	3.2	3.6	6.2
<u>Boys</u>												
Total, 12-17 years	11.4	18.9	12.5	7.9	14.8	9.3	4.1	11.3	5.2	4.0	8.7	7.3
<u>Girls</u>												
Total, 12-17 years	11.7	17.4	13.0	7.4	13.6	9.2	3.3	8.8	4.8	2.7	7.0	5.2
Standard error of average, total	0.40	1.75	0.45	0.20	2.45	0.35	0.25	2.45	0.55	0.20	1.85	0.35

Table 35. Average hearing levels at each test frequency among youths aged 12-17 years, by mobility of the drum of the right and left ear, age, and sex, with standard errors for total averages: United States, 1966-70—Con.

Ear, age, and sex	3000 Hz			4000 Hz			6000 Hz			8000 Hz		
	Yes	No	Pneumatic otoscopy unsatisfactory	Yes	No	Pneumatic otoscopy unsatisfactory	Yes	No	Pneumatic otoscopy unsatisfactory	Yes	No	Pneumatic otoscopy unsatisfactory
RIGHT EAR												
<u>Both sexes</u>												
Total, 12-17 years	7.1	11.2	10.6	10.0	15.8	11.6	14.0	20.6	15.9	9.8	17.0	13.0
12 years	6.8	13.4	10.8	9.7	18.5	11.4	13.0	21.0	14.6	9.6	22.3	12.1
13 years	7.2	12.2	10.4	10.4	16.0	11.4	13.9	21.0	14.4	10.4	13.7	11.2
14 years	6.9	11.0	11.4	10.0	14.3	11.9	13.8	21.1	15.9	9.6	14.8	13.0
15 years	7.5	11.6	10.2	10.1	13.4	12.0	14.2	19.4	16.2	10.2	17.7	12.4
16 years	7.0	11.2	10.6	10.0	20.8	11.8	14.8	24.1	18.2	9.4	19.6	13.8
17 years	7.0	7.6	10.5	10.0	12.2	11.0	14.4	16.7	16.4	9.6	14.6	15.1
<u>Boys</u>												
Total, 12-17 years	8.2	14.5	11.0	11.2	18.8	12.0	15.8	24.8	16.1	10.9	21.4	13.5
<u>Girls</u>												
Total, 12-17 years	6.0	7.2	10.2	8.8	12.3	11.2	12.1	15.6	15.7	8.7	12.0	12.4
Standard error of average, total	0.25	1.15	0.45	0.25	1.25	0.45	0.40	2.00	0.55	0.50	1.65	0.85
LEFT EAR												
<u>Both sexes</u>												
Total, 12-17 years	7.9	12.7	10.6	11.6	17.9	12.8	15.4	20.0	16.2	10.2	16.6	12.6
12 years	7.8	15.2	11.2	11.4	18.7	13.6	14.4	23.0	16.0	10.8	20.6	14.5
13 years	8.4	11.2	10.3	11.8	16.0	12.8	15.1	16.2	16.0	11.0	13.6	12.2
14 years	7.8	11.8	10.2	11.5	15.8	10.6	15.0	18.2	15.0	9.9	17.6	9.3
15 years	8.2	13.0	10.0	11.6	18.4	12.8	15.8	21.2	15.2	10.2	17.2	11.2
16 years	7.6	15.4	11.0	11.6	23.0	14.0	16.2	24.7	16.8	9.2	18.0	13.8
17 years	7.6	9.0	10.6	12.0	15.2	12.5	15.9	16.4	18.5	9.6	11.4	14.6
<u>Boys</u>												
Total, 12-17 years	9.6	13.8	11.8	13.4	20.2	13.8	17.2	23.0	17.8	11.3	18.6	14.0
<u>Girls</u>												
Total, 12-17 years	6.3	11.2	9.2	10.0	14.9	11.6	13.5	16.3	14.4	9.0	14.0	11.0
Standard error of average, total	0.20	2.15	0.45	0.30	2.35	0.65	0.40	2.15	0.50	0.40	2.65	0.70

Table 36. Average hearing levels in the right and left ear at each test frequency among youths aged 12-17 years with bulging or retracted drum, by age and sex, with standard errors for total averages: United States, 1966-70

Ear, age, and sex	250 Hz		500 Hz		1000 Hz		2000 Hz	
	Bulging	Retracted	Bulging	Retracted	Bulging	Retracted	Bulging	Retracted
RIGHT EAR								
<u>Both sexes</u>								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	11.0	14.3	9.4	10.6	1.6	7.4	1.8	5.7
12 years	12.2	19.0	13.8	15.2	-0.8	13.8	4.0	8.8
13 years	13.2	17.6	11.2	8.8	0.0	6.4	-2.2	0.0
14 years	6.2	13.6	6.4	12.4	6.8	9.4	8.0	7.2
15 years	-	12.8	-	10.6	-	4.8	-	6.4
16 years	12.2	10.8	8.6	7.8	2.2	4.5	5.4	3.4
17 years	7.5	13.2	2.5	8.5	2.5	5.8	-2.5	7.8
<u>Boys</u>								
Total, 12-17 years	11.3	17.2	9.0	13.1	3.3	9.9	4.4	8.4
<u>Girls</u>								
Total, 12-17 years	10.6	11.6	10.0	8.3	-1.6	4.9	-3.4	3.2
Standard error of average, total	2.45	1.40	3.75	1.15	1.50	1.50	2.25	1.25
LEFT EAR								
<u>Both sexes</u>								
Total, 12-17 years	10.5	15.0	8.8	10.6	3.6	8.2	1.2	5.6
12 years	12.8	15.0	11.4	12.5	4.6	11.8	-0.8	8.6
13 years	10.9	22.6	10.7	13.3	6.0	8.4	-1.0	4.8
14 years	7.5	14.4	7.5	12.6	-2.5	10.6	-2.5	4.0
15 years	15.0	14.8	13.8	8.6	8.0	6.8	6.2	6.0
16 years	5.4	15.0	-3.0	10.6	-1.0	8.0	3.4	6.0
17 years	7.5	10.3	10.0	6.4	0.0	3.7	-0.1	4.2
<u>Boys</u>								
Total, 12-17 years	9.1	16.6	4.2	11.4	2.6	9.4	1.4	7.4
<u>Girls</u>								
Total, 12-17 years	11.5	13.8	12.2	10.0	4.4	7.2	1.0	3.8
Standard error of average, total	2.25	1.65	2.90	1.40	1.80	1.70	1.75	1.20

Table 36. Average hearing levels in the right and left ear at each test frequency among youths aged 12-17 years with bulging or retracted drum, by age and sex, with standard errors for total averages: United States, 1966-70—Con.

Ear, age, and sex	3000 Hz		4000 Hz		6000 Hz		8000 Hz	
	Bulging	Retracted	Bulging	Retracted	Bulging	Retracted	Bulging	Retracted
RIGHT EAR								
<u>Both sexes</u>								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	7.4	9.6	17.2	13.9	21.6	19.6	19.4	15.2
12 years	7.4	16.7	7.2	19.7	20.6	30.0	13.6	28.8
13 years	5.6	6.2	13.2	10.5	17.4	18.6	13.2	14.8
14 years	6.0	13.2	14.7	15.0	13.2	19.5	10.3	15.2
15 years	-	8.4	-	14.1	-	17.4	-	15.0
16 years	8.8	5.6	34.6	12.4	43.0	19.3	38.0	10.0
17 years	11.2	7.0	20.6	12.3	13.6	16.0	28.8	10.2
<u>Boys</u>								
Total, 12-17 years	9.4	13.6	23.0	17.4	26.6	23.9	26.6	18.8
<u>Girls</u>								
Total, 12-17 years	3.4	5.8	6.4	10.5	12.0	15.4	5.7	11.8
Standard error of average, total	2.55	1.40	4.80	1.35	7.30	1.90	6.55	2.10
LEFT EAR								
<u>Both sexes</u>								
Total, 12-17 years	3.1	11.3	11.8	14.1	13.2	19.3	8.1	12.9
12 years	3.9	13.2	14.2	16.6	5.6	23.6	10.3	18.4
13 years	2.6	11.3	10.6	14.9	13.0	21.9	8.2	13.2
14 years	2.5	11.5	7.5	15.4	2.5	20.0	2.5	13.8
15 years	4.5	10.8	10.6	13.7	28.0	17.1	7.0	12.0
16 years	1.4	9.6	16.5	10.9	6.0	18.8	9.5	12.0
17 years	4.9	12.0	14.8	14.0	17.3	16.0	14.9	8.4
<u>Boys</u>								
Total, 12-17 years	4.0	14.2	12.9	18.6	11.0	23.0	10.0	15.2
<u>Girls</u>								
Total, 12-17 years	2.4	8.8	11.0	10.2	14.8	16.1	6.6	10.9
Standard error of average, total	1.65	1.15	2.45	1.15	6.70	1.15	2.15	1.70

Table 37. Average hearing levels in the right and left ear at each test frequency among youths aged 12-17 years with discoloration of the drum in the test ear, by drum color, age, and sex, with standard errors for total averages: United States, 1966-70

Ear, age, and sex	250 Hz		500 Hz		1000 Hz		2000 Hz	
	Red	Other discoloration	Red	Other discoloration	Red	Other discoloration	Red	Other discoloration
RIGHT EAR								
<u>Both sexes</u>								
Total, 12-17 years	12.3	3.0	9.4	-2.5	5.4	-0.6	4.1	13.0
12 years	13.7	-	13.9	-	6.0	-	5.5	-
13 years	14.6	-	11.6	-	9.1	-	3.2	-
14 years	11.0	12.5	6.4	-2.5	3.3	2.5	3.2	22.5
15 years	11.6	-	12.5	-	10.7	-	8.1	-
16 years	8.7	-2.5	4.2	-	0.9	-2.5	3.0	7.5
17 years	12.4	-	6.2	-	2.6	-	2.8	-
<u>Boys</u>								
Total, 12-17 years	12.5	12.5	9.6	-2.5	5.3	2.5	3.6	22.5
<u>Girls</u>								
Total, 12-17 years	11.9	-2.5	9.0	-2.5	5.6	-2.5	4.8	7.5
Standard error of average, total	1.90	25.85	1.40	22.50	1.95	23.50	1.15	30.75
LEFT EAR								
<u>Both sexes</u>								
Total, 12-17 years	12.4	22.5	8.6	17.5	5.6	2.5	5.6	9.4
12 years	14.6	-	10.0	-	9.4	-	7.6	-
13 years	12.2	22.5	10.4	17.5	9.6	2.5	6.2	7.5
14 years	10.0	-	7.0	-	2.5	-	3.0	-
15 years	11.7	-	10.3	-	7.5	-	6.0	-
16 years	10.0	22.5	4.5	17.5	1.7	2.5	3.7	12.5
17 years	14.4	-	8.9	-	1.9	-	6.1	-
<u>Boys</u>								
Total, 12-17 years	12.9	22.5	6.8	17.5	5.5	2.5	5.2	9.4
<u>Girls</u>								
Total, 12-17 years	11.5	-	11.9	-	5.8	-	6.5	-
Standard error of average, total	1.20	35.00	1.25	32.50	1.20	25.00	1.25	28.50

Table 37. Average hearing levels in the right and left ear at each test frequency among youths aged 12-17 years with discoloration of the drum in the test ear, by drum color, age, and sex, with standard errors for total averages: United States, 1966-70—Con.

Ear, age, and sex	3000 Hz		4000 Hz		6000 Hz		8000 Hz	
	Red	Other discoloration	Red	Other discoloration	Red	Other discoloration	Red	Other discoloration
RIGHT EAR								
<u>Both sexes</u>								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	9.3	9.4	15.0	8.8	17.2	15.6	13.1	3.8
12 years	8.4	-	12.4	-	14.2	-	10.2	-
13 years	11.3	-	15.0	-	18.5	-	15.0	-
14 years	7.5	12.5	12.0	2.5	17.2	12.5	13.1	-2.5
15 years	10.7	-	15.9	-	14.2	-	10.0	-
16 years	11.2	7.5	22.5	12.5	26.1	17.5	13.4	7.5
17 years	7.3	-	15.4	-	12.9	-	16.6	-
<u>Boys</u>								
Total, 12-17 years	9.6	12.5	15.6	2.5	17.9	12.5	13.8	-2.5
<u>Girls</u>								
Total, 12-17 years	8.8	7.5	14.0	12.5	16.0	17.5	11.8	7.5
Standard error of average, total	1.70	28.45	2.35	28.35	3.10	31.60	2.50	25.85
LEFT EAR								
<u>Both sexes</u>								
Total, 12-17 years	7.1	22.4	13.8	21.4	18.2	31.6	11.4	6.4
12 years	9.4	-	17.4	-	17.6	-	12.9	-
13 years	5.6	12.5	9.6	17.5	18.6	37.5	10.0	2.5
14 years	4.7	-	10.5	-	11.4	-	6.9	-
15 years	7.4	-	12.4	-	35.0	-	18.7	-
16 years	7.0	37.5	11.4	27.5	8.1	22.5	7.0	12.5
17 years	6.8	-	17.0	-	20.2	-	12.4	-
<u>Boys</u>								
Total, 12-17 years	7.0	22.4	13.8	21.4	16.4	31.6	10.6	6.4
<u>Girls</u>								
Total, 12-17 years	7.2	-	13.7	-	21.3	-	13.0	-
Standard error of average, total	1.45	36.05	1.50	34.65	2.65	39.85	1.80	27.20

Table 38. Average hearing levels in the right and left ear at each test frequency among youths aged 12-17 years with a perforated drum in the test ear, with and without discharge, by age and sex, with standard errors for total averages: United States, 1966-70

Ear, age, and sex	250 Hz		500 Hz		1000 Hz		2000 Hz	
	With discharge	Without discharge	With discharge	Without discharge	With discharge	Without discharge	With discharge	Without discharge
RIGHT EAR								
Decibels re audiometric zero (ANSI, 1969)								
Both sexes								
Total, 12-17 years	19.8	29.2	15.0	20.0	11.6	16.5	11.4	14.9
12 years	23.0	37.5	15.3	23.0	13.4	20.2	-0.2	17.0
13 years	22.6	-	17.6	-	13.2	-	15.0	-
14 years	19.2	22.1	15.2	14.8	11.8	10.8	11.4	10.0
15 years	17.2	-	15.6	-	13.2	-	14.9	-
16 years	6.0	39.8	4.8	29.4	-0.1	27.0	9.9	24.4
17 years	23.2	27.5	16.3	22.5	13.3	17.5	12.4	17.5
Boys								
Total, 12-17 years	23.8	34.1	19.6	25.0	15.3	18.6	14.9	18.4
Girls								
Total, 12-17 years	16.0	24.5	10.6	15.1	8.2	14.6	8.0	11.4
Standard error of average, total	3.10	3.90	2.00	4.50	2.35	4.00	2.20	3.25
LEFT EAR								
Both sexes								
Total, 12-17 years	15.2	29.3	13.5	2.84	10.7	29.2	8.0	23.6
12 years	16.4	-	15.2	-	12.2	-	7.0	-
13 years	23.1	-	20.4	-	23.1	-	15.4	-
14 years	9.2	37.5	10.2	27.5	3.6	22.5	1.8	17.5
15 years	7.5	-	6.5	-	5.1	-	7.4	-
16 years	9.1	35.2	5.1	35.6	2.8	41.8	3.0	39.7
17 years	20.8	17.8	16.5	20.2	12.0	17.8	12.0	7.7
Boys								
Total, 12-17 years	13.2	29.6	12.6	30.0	9.8	30.5	8.1	25.8
Girls								
Total, 12-17 years	17.2	28.7	14.4	25.3	11.6	26.8	7.8	19.6
Standard error of average, total	2.15	3.85	2.10	2.85	2.95	2.40	2.35	5.20

Table 38. Average hearing levels in the right and left ear at each test frequency among youths aged 12-17 years with a perforated drum in the test ear, with and without discharge, by age and sex, with standard errors for total averages: United States, 1966-70—Con.

Ear, age, and sex	3000 Hz		4000 Hz		6000 Hz		8000 Hz	
	With discharge	Without discharge	With discharge	Without discharge	With discharge	Without discharge	With discharge	Without discharge
RIGHT EAR								
Decibels re audiometric zero (ANSI, 1969)								
<u>Both sexes</u>								
Total, 12-17 years	16.5	21.1	19.8	23.2	25.2	27.9	24.5	27.2
12 years	10.4	27.0	23.4	40.8	19.6	28.0	26.6	29.2
13 years	20.9	-	22.0	-	28.4	-	25.4	-
14 years	15.4	19.6	17.8	15.7	27.6	27.0	25.3	25.9
15 years	17.2	-	23.6	-	29.0	-	20.4	-
16 years	19.6	22.0	20.8	31.8	17.5	31.9	9.9	31.8
17 years	15.4	12.5	15.8	2.5	25.0	22.5	29.6	17.5
<u>Boys</u>								
Total, 12-17 years	22.0	23.3	24.6	28.4	26.1	27.2	26.8	27.4
<u>Girls</u>								
Total, 12-17 years	11.3	19.0	15.2	18.2	24.3	28.6	22.4	27.0
Standard error of average, total	2.35	2.65	2.75	7.75	2.30	4.50	2.50	3.05
LEFT EAR								
<u>Both sexes</u>								
Total, 12-17 years	14.9	22.8	19.6	28.4	21.7	35.3	17.0	26.0
12 years	13.2	-	18.0	-	16.2	-	14.0	-
13 years	23.1	-	26.7	-	33.0	-	26.4	-
14 years	7.4	17.5	13.7	22.5	15.4	22.5	12.8	32.5
15 years	27.8	-	32.0	-	30.9	-	14.4	-
16 years	7.2	33.6	8.7	42.2	18.4	47.4	19.6	32.0
17 years	15.1	12.6	21.0	15.0	22.4	27.8	16.6	15.2
<u>Boys</u>								
Total, 12-17 years	16.6	24.4	20.0	28.0	22.5	39.8	17.3	27.2
<u>Girls</u>								
Total, 12-17 years	13.3	19.6	19.2	29.0	21.0	26.8	16.6	23.7
Standard error of average, total	3.65	6.70	3.15	4.25	3.20	6.70	3.50	4.30

Table 39. Average hearing levels in the right and left ear at each test frequency among youths aged 12-17 years with a scarred drum in the test ear, by age and sex, with standard errors for total averages: United States, 1966-70

Ear, age, and sex	Test frequency							
	250 Hz	500 Hz	1000 Hz	2000 Hz	3000 Hz	4000 Hz	6000 Hz	8000 Hz
RIGHT EAR								
Both sexes								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	12.6	10.6	6.6	4.9	9.4	13.2	18.2	14.9
12 years	12.0	10.4	6.8	3.1	7.4	13.4	15.9	16.1
13 years	12.6	13.8	8.2	7.0	12.6	13.0	21.1	18.8
14 years	14.7	12.4	8.6	6.6	12.2	13.6	18.9	15.2
15 years	12.2	9.9	6.2	6.2	9.6	16.0	20.2	16.6
16 years	12.6	9.4	5.1	3.1	5.3	10.2	17.6	9.8
17 years	11.0	8.2	4.2	3.7	9.6	12.8	16.0	13.9
Boys								
Total, 12-17 years	12.8	11.2	7.1	6.0	11.4	14.9	20.9	17.7
Girls								
Total, 12-17 years	12.4	9.9	5.8	3.6	7.0	11.0	14.9	11.3
Standard error of average, total	1.15	1.00	1.50	1.30	1.40	0.85	1.10	1.20
LEFT EAR								
Both sexes								
Total, 12-17 years	13.4	11.0	7.0	5.0	10.4	14.0	20.4	15.6
12 years	13.6	13.4	7.1	4.2	10.2	13.6	18.8	16.9
13 years	12.4	10.8	8.6	3.6	10.2	12.5	22.8	16.8
14 years	13.5	10.8	7.0	6.1	11.4	13.2	16.8	13.8
15 years	13.6	9.8	5.9	4.0	9.8	14.4	17.0	13.8
16 years	16.0	12.2	9.6	9.8	13.4	18.2	27.0	18.2
17 years	11.8	9.6	4.9	3.6	8.0	12.4	21.8	14.8
Boys								
Total, 12-17 years	13.3	11.3	7.0	4.6	11.8	15.4	21.4	17.4
Girls								
Total, 12-17 years	13.6	10.8	7.0	5.6	8.8	12.5	19.3	13.6
Standard error of average, total	1.35	1.50	1.90	1.20	1.35	1.30	1.70	1.05

Table 40. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years, by condition of the oral pharynx, age, and sex, with standard errors for total averages: United States, 1966-70

Frequency finding	Both sexes							Boys 12-17 years	Girls 12-17 years	Standard error for total
	12-17 years	12 years	13 years	14 years	15 years	16 years	17 years			
<u>250 Hz</u>										
Decibels re audiometric zero (ANSI, 1969)										
Normal	9.1	9.1	9.4	8.8	9.0	9.0	9.5	9.2	9.1	0.30
Abnormal	9.4	11.7	9.8	8.8	8.8	8.8	8.8	8.8	10.2	0.75
<u>500 Hz</u>										
Normal	5.8	6.2	6.2	5.8	6.0	5.4	5.4	6.1	5.6	0.20
Abnormal	6.5	9.0	6.2	7.0	5.8	6.0	5.3	6.3	6.8	0.55
<u>1000 Hz</u>										
Normal	1.6	1.8	1.8	1.6	1.5	1.4	1.2	1.8	1.2	0.20
Abnormal	2.4	4.8	1.8	2.5	1.3	1.8	2.1	1.9	2.9	0.35
<u>2000 Hz</u>										
Normal	1.0	1.0	1.2	1.1	1.2	0.9	0.8	1.5	0.6	0.20
Abnormal	1.6	2.0	0.6	0.8	1.5	2.9	2.2	1.8	1.6	0.65
<u>3000 Hz</u>										
Normal	5.2	5.0	5.5	5.2	5.6	5.1	5.0	6.4	4.0	0.20
Abnormal	6.5	8.0	6.2	6.4	5.2	7.4	5.8	6.9	6.0	0.70
<u>4000 Hz</u>										
Normal	8.0	7.8	8.4	7.7	8.0	7.8	8.0	9.2	6.7	0.25
Abnormal	8.6	9.8	7.8	7.4	7.1	10.1	9.0	9.0	8.0	0.75
<u>6000 Hz</u>										
Normal	11.2	10.0	11.0	11.0	11.4	12.2	11.4	12.6	9.6	0.30
Abnormal	11.2	13.4	9.4	9.9	10.1	12.4	12.4	12.6	9.8	0.85
<u>8000 Hz</u>										
Normal	6.6	6.8	7.3	6.4	6.9	6.2	6.3	7.5	5.8	0.45
Abnormal	7.4	10.8	6.0	7.8	6.6	5.8	7.3	7.3	7.4	0.90

Table 41. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years, by condition of tonsils, age, and sex, with standard errors for total averages: United States, 1966-70

Condition of tonsils, age, and sex	Test frequency							
	250 Hz	500 Hz	1000 Hz	2000 Hz	3000 Hz	4000 Hz	6000 Hz	8000 Hz
<u>TONSILS NOT VISIBLE</u>								
<u>Both sexes</u>								
Total, 12-17 years	9.0	6.0	1.6	0.7	4.8	7.2	11.0	6.4
12 years	9.0	6.2	1.6	0.6	4.8	7.2	10.2	6.8
13 years	10.0	6.4	1.8	1.2	5.1	7.8	11.2	7.2
14 years	8.8	6.1	2.0	1.1	4.8	7.8	11.3	7.0
15 years	8.9	5.9	1.4	0.8	4.8	7.2	11.1	6.1
16 years	8.8	5.8	1.4	0.4	4.6	6.6	11.5	5.6
17 years	8.8	5.4	1.1	0.2	4.4	7.0	10.8	6.2
<u>Boys</u>								
Total, 12-17 years	9.0	6.4	1.7	1.0	5.7	8.3	12.2	7.0
<u>Girls</u>								
Total, 12-17 years	9.2	5.5	1.4	0.4	3.8	6.2	9.8	5.8
Standard error, total	0.40	0.20	0.25	0.20	0.20	0.35	0.50	0.55
<u>TONSILLAR TAGS</u>								
<u>Both sexes</u>								
Total, 12-17 years	8.4	5.2	0.9	0.4	5.0	7.4	10.7	6.0
12 years	7.6	5.9	2.4	0.6	5.8	7.4	10.2	5.6
13 years	8.1	4.8	0.5	-1.3	4.0	7.8	10.8	6.8
14 years	9.0	5.8	1.0	1.0	4.4	7.1	9.6	5.6
15 years	7.6	4.6	0.3	0.0	5.0	6.5	9.4	5.4
16 years	8.3	4.5	0.2	0.5	4.6	7.3	12.1	5.3
17 years	10.6	5.8	1.7	2.1	6.4	8.6	12.2	8.4
<u>Boys</u>								
Total, 12-17 years	8.6	5.6	1.4	0.8	5.9	8.5	12.3	7.6
<u>Girls</u>								
Total, 12-17 years	8.2	4.6	0.4	0.0	3.8	6.1	8.8	4.3
Standard error, total	0.80	0.35	0.35	0.60	0.35	0.70	0.30	0.65

Table 41. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years, by condition of tonsils, age, and sex, with standard errors for total averages: United States, 1966-70—Con.

Condition of tonsils, age, and sex	Test frequency							
	250 Hz	500 Hz	1000 Hz	2000 Hz	3000 Hz	4000 Hz	6000 Hz	8000 Hz
<u>TONSILS—GRADE I</u>								
<u>Both sexes</u>								
Total, 12-17 years	9.2	5.7	1.6	1.2	5.1	8.2	11.0	6.2
12 years	9.2	6.0	2.0	1.0	4.4	7.9	10.0	6.4
13 years	9.2	6.0	1.6	1.3	5.4	8.2	10.6	6.8
14 years	8.4	5.3	1.0	1.0	5.2	7.2	10.8	5.8
15 years	9.4	6.1	1.8	1.6	5.4	8.7	11.4	6.9
16 years	9.2	5.6	1.8	1.0	5.1	8.4	12.4	6.1
17 years	9.7	5.4	1.1	1.2	5.0	8.8	11.2	5.2
<u>Boys</u>								
Total, 12-17 years	9.2	5.8	1.8	1.6	6.2	9.4	12.7	6.9
<u>Girls</u>								
Total, 12-17 years	9.2	5.7	1.3	0.6	4.0	7.0	9.4	5.4
Standard error, total	0.35	0.25	0.25	0.30	0.25	0.35	0.35	0.55
<u>TONSILS—GRADE II</u>								
<u>Both sexes</u>								
Total, 12-17 years	9.4	6.4	2.0	1.7	6.3	8.7	11.6	7.8
12 years	9.9	7.0	2.1	1.8	6.2	8.7	10.6	8.2
13 years	9.6	6.6	2.2	1.6	6.5	9.2	11.1	7.7
14 years	8.8	6.3	2.0	1.3	5.8	8.2	11.1	7.2
15 years	9.2	6.4	1.8	2.2	6.8	8.6	12.4	8.3
16 years	9.4	5.6	1.8	2.4	6.9	9.4	12.7	7.8
17 years	9.5	5.6	1.6	1.2	5.5	8.2	12.4	7.9
<u>Boys</u>								
Total, 12-17 years	9.4	6.6	2.3	2.2	7.8	10.0	13.0	8.6
<u>Girls</u>								
Total, 12-17 years	9.5	6.1	1.6	1.1	4.8	7.4	10.0	7.0
Standard error, total	0.50	0.30	0.30	0.25	0.45	0.40	0.40	0.45

Table 41. Average hearing levels in the better ear at each test frequency among youths aged 12-17 years, by condition of tonsils, age, and sex, with standard errors for total averages: United States, 1966-70—Con.

Condition of tonsils, age, and sex	Test frequency							
	250 Hz	500 Hz	1000 Hz	2000 Hz	3000 Hz	4000 Hz	6000 Hz	8000 Hz
TONSILS—GRADE III								
<u>Both sexes</u>								
Hearing levels in decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	13.4	6.6	2.4	4.2	7.2	8.6	11.1	13.0
12 years	12.5	7.5	7.5	7.9	3.8	11.6	4.6	7.5
13 years	13.4	4.3	0.2	4.0	6.8	3.0	13.6	18.6
14 years	12.5	7.5	2.5	7.5	12.5	7.5	-7.5	-2.5
15 years	14.2	9.4	2.2	1.4	8.5	15.4	17.3	12.8
16 years	-	-	-	-	-	-	-	-
17 years	-	-	-	-	-	-	-	-
<u>Boys</u>								
Total, 12-17 years	15.9	9.1	2.4	5.2	12.8	14.6	18.0	14.2
<u>Girls</u>								
Total, 12-17 years	12.6	5.8	2.4	4.0	5.4	6.8	8.9	12.6
Standard error, total	13.65	12.20	11.40	12.05	13.00	13.20	13.70	14.00

Table 42. Average hearing levels in the right and left ear among youths aged 12-17 years, by condition of the nasal passages, age, and sex, with standard errors for total averages: United States, 1966-70

Ear, age, and sex	250 Hz		500 Hz		1000 Hz		2000 Hz	
	Normal	Abnormal	Normal	Abnormal	Normal	Abnormal	Normal	Abnormal
RIGHT EAR								
<u>Both sexes</u>								
Total, 12-17 years	10.6	10.8	7.4	8.6	3.4	4.2	3.2	3.2
12 years	10.8	12.3	7.8	9.6	3.8	4.6	3.0	3.1
13 years	11.0	12.2	7.8	9.0	3.4	4.2	3.1	3.0
14 years	10.4	10.8	7.6	10.0	3.4	5.0	3.4	4.6
15 years	10.5	10.9	7.6	8.6	3.3	4.0	3.6	2.5
16 years	10.5	9.0	7.0	7.6	3.1	3.3	3.2	3.3
17 years	10.8	9.7	6.8	7.0	3.0	3.6	3.0	2.5
<u>Boys</u>								
Total, 12-17 years	10.7	10.1	7.7	8.2	3.5	3.8	3.6	3.0
<u>Girls</u>								
Total, 12-17 years	10.6	12.0	7.2	9.4	3.2	4.7	2.9	3.4
Standard error of average, total	0.30	0.65	0.20	0.50	0.20	0.45	0.20	0.30
LEFT EAR								
<u>Both sexes</u>								
Total, 12-17 years	11.8	11.4	7.8	8.8	3.8	4.7	3.6	3.8
12 years	11.6	11.8	8.2	9.8	4.4	4.4	3.8	3.6
13 years	12.1	12.6	8.2	9.0	4.2	5.2	4.0	3.0
14 years	11.2	11.2	7.8	10.0	3.6	5.8	3.3	4.7
15 years	11.8	11.2	7.9	8.2	3.8	4.6	3.8	4.2
16 years	12.0	9.8	7.2	7.8	3.6	4.1	3.4	4.5
17 years	12.0	11.4	7.6	8.0	3.5	4.2	3.4	2.6
<u>Boys</u>								
Total, 12-17 years	11.7	11.0	8.1	8.7	4.2	5.1	4.4	4.0
<u>Girls</u>								
Total, 12-17 years	11.9	11.9	7.6	9.0	3.4	4.1	2.9	3.6
Standard error of average, total	0.35	0.85	0.20	0.55	0.25	0.40	0.20	0.45

Table 42. Average hearing levels in the right and left ear among youths aged 12-17 years, by condition of the nasal passages, age, and sex, with standard errors for total averages: United States, 1966-70—Con.

Ear, age, and sex	3000 Hz		4000 Hz		6000 Hz		8000 Hz	
	Normal	Abnormal	Normal	Abnormal	Normal	Abnormal	Normal	Abnormal
RIGHT EAR								
Both sexes								
Decibels re audiometric zero (ANSI, 1969)								
Total, 12-17 years	7.4	8.2	10.2	11.2	14.2	15.1	10.1	10.9
12 years	7.2	8.0	9.8	11.5	13.2	13.9	10.0	10.1
13 years	7.6	6.9	10.5	10.6	13.9	15.8	10.4	11.7
14 years	7.0	10.0	10.0	11.8	14.0	15.1	9.7	12.0
15 years	7.7	8.6	10.2	11.0	14.3	16.2	10.4	12.6
16 years	7.2	8.8	10.2	11.4	15.4	14.8	9.9	10.7
17 years	7.4	6.8	10.2	10.4	14.5	15.0	10.3	8.2
Boys								
Total, 12-17 years	8.5	8.4	11.4	11.2	16.0	16.2	11.2	11.8
Girls								
Total, 12-17 years	6.3	8.0	8.8	11.0	12.4	13.5	9.0	9.4
Standard error of average, total	0.25	0.60	0.25	0.60	0.40	0.55	0.50	0.80
LEFT EAR								
Both sexes								
Total, 12-17 years	8.1	9.4	11.8	12.3	15.4	16.0	10.4	10.8
12 years	8.2	8.3	11.7	12.0	14.6	14.8	11.1	12.6
13 years	8.6	9.0	12.0	11.8	15.2	15.1	11.2	10.8
14 years	7.8	11.5	11.3	14.2	14.8	17.8	9.9	11.2
15 years	8.4	8.8	12.0	10.8	15.8	16.0	10.4	10.2
16 years	7.7	11.1	11.9	13.4	16.4	16.0	9.8	10.1
17 years	7.8	8.0	12.0	12.0	16.1	16.4	10.0	9.4
Boys								
Total, 12-17 years	9.8	10.0	13.6	13.2	17.4	17.2	11.7	11.6
Girls								
Total, 12-17 years	6.4	8.6	10.1	11.0	13.6	14.2	9.2	9.6
Standard error of average, total	0.20	0.75	0.30	0.90	0.40	0.80	0.40	1.00

Table 43. Average hearing levels in the right and left ear among youths aged 12-17 years, by obstruction of the nasal passages, age, and sex, with standard errors for total averages: United States, 1966-70

Ear, nare, age, and sex	250 Hz			500 Hz			1000 Hz			2000 Hz		
	Total	Acute	Chronic	Total	Acute	Chronic	Total	Acute	Chronic	Total	Acute	Chronic
Decibels re audiometric zero (ANSI, 1969)												
<u>RIGHT EAR-RIGHT NARE</u>												
<u>Both sexes</u>												
Total, 12-17 years	10.8	10.4	13.0	9.0	8.8	10.4	4.0	3.8	5.6	3.6	3.4	5.2
12 years	14.2	14.4	13.6	10.9	11.0	10.2	5.3	5.4	4.8	4.2	5.0	0.8
13 years	12.4	12.0	14.2	10.0	10.2	9.0	5.1	5.0	5.5	4.0	4.0	4.2
14 years	9.8	9.4	12.2	9.2	9.2	9.6	4.4	3.8	7.0	5.6	3.8	14.4
15 years	9.6	9.0	12.6	8.4	8.4	8.8	3.4	3.4	3.6	2.1	1.4	5.4
16 years	8.4	7.5	16.8	7.5	6.6	15.6	3.3	2.4	10.4	2.6	2.7	1.3
17 years	9.0	9.0	9.0	7.4	6.7	11.3	2.0	2.0	2.4	2.2	2.6	-0.2
<u>Boys</u>												
Total, 12-17 years	9.4	9.1	10.8	8.0	7.8	9.3	3.2	3.0	4.4	3.1	2.5	6.7
<u>Girls</u>												
Total, 12-17 years	12.6	12.0	15.7	10.4	10.2	11.8	5.2	4.9	7.0	4.4	4.6	3.2
Standard error of average, total	1.00	1.05	1.15	0.70	0.75	1.15	0.70	0.90	1.30	0.50	0.60	1.05
<u>LEFT EAR-LEFT NARE</u>												
<u>Both sexes</u>												
Total, 12-17 years	10.8	10.2	13.7	9.0	8.4	12.0	4.6	4.2	6.6	3.2	3.0	4.4
12 years	13.3	13.0	14.0	12.0	11.0	15.2	5.8	4.8	8.9	3.8	3.8	4.0
13 years	12.2	12.4	10.5	9.3	9.4	9.1	6.2	6.3	5.3	1.4	1.5	0.2
14 years	10.4	9.5	14.0	9.0	8.1	12.2	4.4	4.0	6.0	4.4	4.4	4.2
15 years	10.2	9.4	15.1	8.5	8.3	9.6	4.2	3.7	7.6	4.3	3.0	11.8
16 years	8.6	8.0	13.2	7.8	7.8	7.2	4.2	4.6	1.4	4.0	3.8	5.8
17 years	10.3	9.4	13.9	7.6	6.0	14.5	2.6	1.3	8.4	0.8	0.7	1.0
<u>Boys</u>												
Total, 12-17 years	10.8	10.2	13.0	9.2	8.6	11.2	5.0	4.6	6.6	3.4	3.0	5.4
<u>Girls</u>												
Total, 12-17 years	10.8	10.0	15.4	8.8	8.1	14.2	4.0	3.6	6.7	3.0	3.1	2.0
Standard error of average, total	1.40	1.55	1.25	0.75	0.70	1.50	0.60	0.75	1.30	0.50	0.50	2.65

Table 43. Average hearing levels in the right and left ear among youths aged 12-17 years, by obstruction of the nasal passages, age, and sex, with standard errors for total averages: United States, 1966-70—Con.

Ear, nare, age, and sex	3000 Hz			4000 Hz			6000 Hz			8000 Hz		
	Total	Acute	Chronic	Total	Acute	Chronic	Total	Acute	Chronic	Total	Acute	Chronic
Decibels re audiometric zero (ANSI, 1969)												
RIGHT EAR-RIGHT NARE												
Both sexes												
Total, 12-17 years	8.8	8.8	9.0	11.1	11.2	10.4	14.7	14.5	15.8	10.1	9.5	13.2
12 years	9.0	10.2	3.6	12.6	13.4	8.7	13.6	14.2	11.0	10.8	9.8	15.2
13 years	7.6	7.6	7.5	11.6	11.0	15.3	16.2	14.6	25.5	9.8	9.6	11.6
14 years	10.6	10.0	13.6	12.2	12.0	13.0	14.6	14.0	17.7	12.4	12.4	12.2
15 years	9.2	9.0	9.8	12.0	12.7	8.0	14.1	14.8	10.9	9.0	7.9	14.9
16 years	8.6	8.4	10.4	8.8	8.6	9.5	13.8	13.4	16.6	8.0	7.6	12.0
17 years	6.6	6.2	9.0	8.8	9.0	7.4	16.6	16.8	15.2	9.1	8.6	12.3
Boys												
Total, 12-17 years	8.4	8.2	9.6	10.5	10.6	9.8	15.0	14.6	18.0	10.2	9.4	15.4
Girls												
Total, 12-17 years	9.2	9.5	8.2	12.0	12.2	11.2	14.2	14.5	13.0	9.9	9.8	10.6
Standard error of average, total	0.75	0.90	1.15	0.90	1.15	1.15	0.65	0.70	1.45	1.20	1.35	1.25
LEFT EAR-LEFT NARE												
Both sexes												
Total, 12-17 years	9.5	9.7	8.8	11.8	12.0	10.6	16.0	16.2	15.3	9.4	9.0	10.8
12 years	7.8	8.9	4.4	12.0	12.4	10.9	15.9	16.8	13.2	12.6	12.9	12.0
13 years	10.3	10.4	9.8	12.1	12.0	12.8	12.5	13.6	4.3	7.2	8.0	1.6
14 years	9.7	9.8	9.2	12.9	12.6	13.9	17.2	16.6	19.2	9.8	9.2	12.0
15 years	8.8	7.7	14.8	9.6	9.3	11.6	16.0	15.2	21.0	7.3	4.8	22.2
16 years	12.9	13.5	8.2	13.6	14.4	7.4	16.5	16.7	14.8	9.2	9.6	5.6
17 years	7.0	6.6	8.6	9.4	10.4	5.6	17.6	18.3	14.4	9.6	10.0	7.6
Boys												
Total, 12-17 years	9.8	10.2	8.3	12.1	12.6	9.8	16.8	17.4	14.8	9.7	9.7	9.7
Girls												
Total, 12-17 years	9.0	9.0	9.7	11.2	11.0	12.5	15.0	14.8	16.6	8.9	8.2	13.5
Standard error of average, total	1.05	1.30	2.05	1.20	1.45	1.45	0.95	1.15	1.15	1.40	1.70	1.50

Table 44. Prevalence of selected otoscopic findings in one or both ears and the average hearing levels at 1000 and 4000 Hz among youths aged 12-17 years, with standard errors for total averages: United States, 1966-70

Ear-throat finding	Number of youths 12-17 years		Average hearing level in test ear at				Standard errors of average hearing levels			
			1000 Hz		4000 Hz		1000 Hz		4000 Hz	
	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
	Number in thousands		Decibels re audiometric zero (ANSI, 1969)							
Test eardrum normal	18,733	18,739	3.0	3.5	9.7	11.4	0.20	0.25	0.25	0.30
Both drums normal	17,165	17,165	2.8	3.4	9.6	11.3	0.20	0.25	0.30	0.30
Test eardrum normal, other not visible	698	684	3.3	3.8	11.6	12.1	0.70	0.50	1.05	0.45
Test eardrum abnormal	2,369	2,346	6.2	6.6	13.7	14.4	0.55	0.60	0.50	0.45
Both drums abnormal	1,396	1,396	5.8	6.2	13.8	14.6	0.60	0.80	0.50	0.65
Test eardrum abnormal, other normal	891	871	6.6	6.8	13.4	13.7	0.70	0.85	1.00	0.80
Test eardrum perforated	161	162	12.7	13.2	23.6	20.8	1.65	3.05	1.80	2.75
Both drums perforated	47	47	18.0	18.0	31.6	29.6	5.45	7.75	3.65	3.85
Test eardrum perforated, other normal	70	91	6.6	10.0	16.6	16.4	2.65	3.50	2.60	3.45
Test eardrum not mobile	400	388	8.0	10.2	15.8	17.9	1.70	2.45	1.25	2.35
Both drums not mobile	191	191	6.4	7.9	14.4	16.4	2.30	2.05	2.05	2.20
Test eardrum not mobile, other normal	229	201	5.2	8.6	13.8	16.6	1.10	2.50	1.65	2.25
Test eardrum retracted	446	449	7.4	8.2	13.9	14.1	1.50	1.70	1.35	1.15
Both drums retracted	240	240	7.2	7.3	14.1	14.0	2.10	1.55	1.80	1.25
Test eardrum retracted, other normal	169	146	8.2	8.0	14.2	12.4	1.75	2.70	2.10	1.85
Test eardrum discolored	206	160	5.2	5.4	14.8	14.0	1.90	1.15	2.35	1.45
Both drums discolored	50	50	4.2	5.4	12.6	16.0	2.70	2.55	2.15	3.45
Test eardrum discolored, other normal	112	86	4.8	4.4	14.2	12.4	1.65	1.10	2.30	1.05
Test eardrum scarred	745	700	6.6	7.0	13.2	14.0	1.50	1.90	0.85	1.30
Both drums scarred	409	409	6.0	5.6	12.7	13.2	2.50	2.70	1.50	1.70
Test eardrum scarred, other normal	256	223	6.8	8.4	12.0	14.0	1.25	1.50	1.25	1.50

Table 45. Prevalence rates of selected events in the medical history that may be associated with hearing impairment among examinees in both the Health Examination Surveys of 1963-65 and 1966-70, by age at examination in 1966-70 and sex, with standard errors for total rates: United States

Age and sex	Trouble hearing (per parent)		Earaches (per parent)		Running ears (per parent)	
	6-11 years	12-17 years	Ever 6-11 years	Last year 12-17 years	6-11 years	12-17 years
<u>Both sexes</u>						
Rate per 100 youths						
Total, 12-17 years	4.4	3.5	25.9	14.8	11.8	9.4
12 years	4.1	2.6	27.7	15.9	11.7	8.6
13 years	3.8	2.7	24.3	14.2	12.6	9.5
14 years	5.2	4.6	23.2	14.4	10.2	9.7
15 years	5.1	4.7	30.8	15.4	13.2	10.2
16 years	-	-	27.5	5.3	11.7	18.4
17 years	-	-	-	-	-	-
<u>Boys</u>						
Total, 12-17 years	5.0	3.1	22.0	11.2	10.8	9.0
12 years	4.2	2.5	24.9	10.5	10.6	7.9
13 years	5.5	2.7	23.2	11.5	12.0	8.4
14 years	5.9	4.6	16.5	10.9	10.2	10.3
15 years	3.9	2.3	24.2	13.7	9.6	8.8
16 years	-	-	27.5	-	19.4	32.1
17 years	-	-	-	-	-	-
<u>Girls</u>						
Total, 12-17 years	3.9	3.8	29.7	18.4	12.7	9.9
12 years	4.0	2.8	30.5	21.4	12.8	9.4
13 years	2.0	2.8	25.3	17.0	13.3	10.5
14 years	4.5	4.5	29.7	17.6	10.2	9.2
15 years	6.3	7.1	37.3	17.1	16.9	11.5
16 years	-	-	27.4	12.3	-	-
17 years	-	-	-	-	-	-
<u>Standard error</u>						
Total, 12-17 years	0.35	0.40	0.76	1.22	0.77	0.60
Boys, 12-17 years	0.65	0.66	1.69	1.19	0.97	1.11
Girls, 12-17 years	0.61	0.61	1.41	1.59	1.21	0.99

Table 46. Prevalence rates of selected ear, nose, and throat abnormalities among examinees in both the Health Examination Surveys of 1963-65 and 1966-70, by age at examination in 1966-70 and sex, with standard errors for total rates: United States

Age in youth examination and sex	Abnormalities of right drum		Right drum bulging or retracted		Not visible		Tonsils								Abnormalities of oral pharynx	
							Tags		Grade I		Grade II		Grade III			
	6-11 years	12-17 years	6-11 years	12-17 years	6-11 years	12-17 years	6-11 years	12-17 years	6-11 years	12-17 years	6-11 years	12-17 years	6-11 years	12-17 years	6-11 years	12-17 years
Prevalence rate per 100 youths																
Both sexes																
Total, 12-17 years	12.6	10.5	5.9	2.4	17.5	27.6	10.2	9.9	41.1	32.6	30.6	29.8	0.6	0.1	10.1	6.6
12 years	13.4	10.7	6.2	1.5	17.4	27.8	8.3	7.9	39.8	32.7	33.7	31.4	0.8	0.2	11.3	7.4
13 years	10.4	9.5	5.0	2.5	19.0	27.1	11.5	10.8	39.6	31.9	29.2	29.9	0.7	0.2	8.4	6.5
14 years	13.7	11.2	6.8	3.4	17.4	29.8	10.2	9.3	42.0	34.3	30.2	26.6	0.1	-	9.5	4.8
15 years	14.2	10.3	6.0	2.2	14.4	23.2	10.9	13.1	45.5	30.5	28.1	32.8	1.1	0.3	12.3	9.2
16 years	5.7	24.4	-	-	23.2	29.9	17.7	11.6	34.2	34.4	24.9	24.2	-	-	5.1	-
17 years	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boys																
Total, 12-17 years	13.8	11.1	6.8	2.2	19.1	28.2	11.6	10.7	38.6	31.5	30.3	29.7	0.3	-	10.5	6.6
12 years	13.4	11.6	7.0	1.3	18.7	26.8	8.9	9.7	36.5	33.9	35.5	29.6	0.5	-	11.4	6.8
13 years	12.0	10.3	5.3	1.9	21.2	29.9	12.1	10.8	37.0	28.5	29.1	30.8	0.6	-	8.5	6.8
14 years	15.6	10.8	7.7	4.0	20.1	32.1	13.1	9.9	40.0	32.1	26.7	25.9	-	-	11.4	4.5
15 years	15.0	11.5	8.4	1.2	13.5	18.7	12.4	13.9	44.3	31.4	29.8	35.9	-	-	11.4	10.2
16 years	9.9	31.0	-	-	18.0	41.0	31.0	8.9	27.9	39.8	23.0	10.3	-	-	8.9	-
17 years	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Girls																
Total, 12-17 years	11.5	9.9	5.1	2.6	15.8	27.0	8.8	9.1	43.6	33.7	30.8	29.9	1.0	0.3	9.6	6.7
12 years	13.4	9.9	5.5	1.8	16.1	29.0	7.7	6.0	43.1	31.5	31.9	33.2	1.2	0.4	11.2	8.1
13 years	8.6	8.6	4.6	3.1	16.7	24.3	11.0	10.8	42.2	35.5	29.3	29.0	0.8	0.4	8.3	6.1
14 years	11.8	11.4	5.9	2.8	14.7	27.7	7.4	8.7	44.0	36.3	33.6	27.2	0.2	-	7.6	5.2
15 years	13.4	9.0	3.6	3.2	15.3	27.7	9.3	12.3	46.7	29.5	26.4	29.8	2.2	0.6	13.2	8.2
16 years	-	15.6	-	-	30.1	15.0	-	15.0	42.6	27.2	27.3	42.6	-	-	-	-
17 years	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Standard error																
Total, 12-17 years	1.29	1.66	0.87	0.67	1.48	1.96	1.48	1.30	1.77	2.94	1.74	2.23	0.22	0.08	1.69	1.28
Boys, 12-17 years	1.32	1.79	0.95	0.64	1.85	1.95	1.79	1.54	2.38	2.84	2.09	2.85	0.16	-	1.42	1.40
Girls, 12-17 years	1.61	1.66	0.91	0.76	1.65	2.48	1.52	1.21	1.75	3.31	2.06	2.00	0.35	0.16	2.03	1.28

Table 47. Mean hearing levels at eight test frequencies and estimates for speech among examinees in both the Health Examination Surveys of 1963-65 and 1966-70, by age at examination in 1966-70 and sex: United States

Age in youth examination	250 Hz		500 Hz		1000 Hz		2000 Hz		3000 Hz	
	Cycle II	Cycle III	Cycle II	Cycle III	Cycle II	Cycle III	Cycle II	Cycle III	Cycle II	Cycle III
Both sexes										
Decibels re audiometric zero (ASA, 1951)										
Total, 12-17 years	-10.4	-10.4	-10.0	-8.5	-8.7	-8.6	-9.8	-8.5	-5.7	-4.2
12 years	-10.0	-10.2	-9.4	-8.2	-8.2	-8.4	-9.6	-8.6	-5.6	-4.6
13 years	-10.3	-10.1	-10.2	-8.8	-8.8	-8.5	-10.4	-8.8	-6.0	-4.6
14 years	-11.0	-10.8	-10.6	-8.6	-9.4	-8.8	-10.0	-8.3	-6.0	-3.8
15 years	-10.4	-10.8	-9.4	-8.4	-8.5	-8.8	-8.6	-8.1	-4.6	-2.6
16 years	-10.0	-11.8	-8.2	-7.0	-6.2	-9.3	-8.4	-9.6	-4.8	-4.8
17 years	-	-	-	-	-	-	-	-	-	-
Boys										
Total, 12-17 years	-10.7	-10.6	-9.8	-8.4	-8.2	-8.4	-9.4	-8.0	-5.4	-3.2
12 years	-10.4	-10.6	-9.3	-8.0	-7.6	-8.0	-9.2	-7.8	-5.4	-3.7
13 years	-10.7	-10.4	-10.1	-9.0	-8.6	-8.3	-10.1	-8.3	-5.9	-3.8
14 years	-11.1	-10.6	-10.3	-8.2	-8.8	-8.5	-9.7	-8.2	-5.6	-2.6
15 years	-10.8	-10.7	-9.7	-8.4	-8.0	-9.0	-8.1	-7.5	-3.9	-1.5
16 years	-9.2	-10.8	-6.6	-6.2	-3.2	-8.2	-8.4	-10.6	-5.6	-4.8
17 years	-	-	-	-	-	-	-	-	-	-
Girls										
Total, 12-17 years	-10.2	-10.2	-10.0	-8.6	-9.2	-8.8	-10.1	-9.0	-6.0	-5.2
12 years	-9.6	-9.7	-9.6	-8.3	-8.6	-8.7	-9.9	-9.4	-5.8	-5.6
13 years	-9.8	-9.8	-10.2	-8.8	-9.1	-8.7	-10.6	-9.3	-6.1	-5.6
14 years	-11.0	-10.9	-10.8	-9.0	-9.8	-9.0	-10.3	-8.4	-6.4	-4.9
15 years	-10.0	-10.8	-9.2	-8.3	-8.9	-8.6	-9.1	-8.7	-5.2	-3.8
16 years	-11.0	-13.3	-10.4	-8.2	-10.4	-10.8	-8.3	-8.4	-3.8	-4.7
17 years	-	-	-	-	-	-	-	-	-	-
Standard error										
Total, 12-17 years	0.20	0.20	0.35	0.20	0.35	0.25	0.25	0.25	0.40	0.25
Boys, 12-17 years	0.25	0.25	0.35	0.25	0.40	0.30	0.30	0.25	0.45	0.25
Girls, 12-17 years	0.25	0.25	0.40	0.20	0.35	0.25	0.25	0.30	0.40	0.35

Table 47. Mean hearing levels at eight test frequencies and estimates for speech among examinees in both the Health Examination Surveys of 1963-65 and 1966-70, by age at examination in 1966-70 and sex: United States—Con.

Age in youth examination	4000 Hz		6000 Hz		8000 Hz		Speech	
	Cycle II	Cycle III	Cycle II	Cycle III	Cycle II	Cycle III	Cycle II	Cycle III
<u>Both sexes</u>								
Decibels re audiometric zero (ASA, 1951)								
Total, 12-17 years	-2.8	-1.8	-2.7	1.3	-6.8	-7.5	-9.6	-6.6
12 years	-2.4	-2.2	-3.6	0.4	-7.0	-7.6	-9.1	-6.5
13 years	-3.2	-2.0	-2.6	1.0	-6.6	-7.6	-9.9	-6.8
14 years	-3.2	-1.8	-2.8	1.4	-7.0	-8.0	-10.0	-6.6
15 years	-1.8	-0.6	-1.0	3.4	-6.0	-6.0	-8.8	-6.6
16 years	-4.1	-3.4	-0.6	2.8	-6.9	-7.9	-7.6	-6.7
17 years	-	-	-	-	-	-	-	-
<u>Boys</u>								
Total, 12-17 years	-2.5	-1.0	-2.4	2.6	-6.4	-7.0	-9.2	-6.4
12 years	-2.4	-1.6	-3.4	1.8	-6.5	-7.0	-8.8	-6.0
13 years	-2.8	-1.4	-2.4	1.8	-6.7	-7.4	-9.8	-6.6
14 years	-3.0	-1.0	-2.6	3.0	-6.8	-7.6	-9.6	-6.3
15 years	-0.9	1.1	-0.2	4.8	-4.9	-5.2	-8.6	-6.6
16 years	-4.7	-3.7	0.8	5.2	-6.2	-4.4	-5.6	-5.6
17 years	-	-	-	-	-	-	-	-
<u>Girls</u>								
Total, 12-17 years	-3.1	-2.6	-3.0	0.0	-7.1	-8.0	-9.8	-7.0
12 years	-2.5	-2.6	-3.8	-0.8	-7.5	-8.1	-9.4	-7.0
13 years	-3.5	-2.6	-2.9	0.2	-6.6	-8.0	-10.0	-7.0
14 years	-3.6	-2.6	-3.0	-0.1	-7.2	-8.5	-10.4	-7.0
15 years	-2.6	-2.2	-1.6	2.0	-7.2	-6.7	-9.0	-6.6
16 years	-3.3	-3.2	-2.2	-0.4	-8.0	-12.6	-10.4	-8.2
17 years	-	-	-	-	-	-	-	-
<u>Standard error</u>								
Total, 12-17 years	0.35	0.20	0.45	0.30	0.35	0.40	0.30	0.10
Boys, 12-17 years	0.40	0.30	0.55	0.40	0.45	0.45	0.35	0.15
Girls, 12-17 years	0.40	0.25	0.45	0.30	0.35	0.40	0.30	0.15

APPENDIX I

STATISTICAL NOTES

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 unit, census enumeration district, segment (a cluster of households), eligible persons, and finally, the sample person.

The 40 sample areas and the segments utilized in the design of Cycle III were the same as those in Cycle II. 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 to control the selection of siblings.^{4,5}

Requirements and limitations placed on the design for Cycle III, similar to those for children in Cycle II, 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 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, of about 4.5 million persons each, 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, were 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 age 5-9 in the ED at the time

NOTE: A list of references follows the text.

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 youths in the sample drawn for a particular location exceeded this number, subsampling was done by deleting from the master list of eligible youth (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 Cycle III, as in Cycle II, twins who were deleted in the sample selection were also scheduled for examination, time permitting, as were youths deleted from the Cycle III sample who had been examined in Cycle II. The sample was selected in Cycle III, as it had been for the children in Cycle II, so as to contain the correct proportion of youths from families having only one eligible youth, two eligible youths, 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 youths in the resultant sample is greater than would come from a design which sampled youths 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} youth would be selected.

The total probability sample for Cycle III included 7,514 youths representative of the approximately 22.7 million noninstitutionalized

U.S. youths age 12-17 years. The sample contained youths from 25 different States and approximately 1,000 in each single year of age.

The response rate in Cycle III was 90 percent, with 6,768 youths examined out of the total sample. These examinees were closely representative of those in the sample as well as the population from which the sample was 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;^{6 16} those additional measures specifically related to the testing of hearing are outlined in an earlier section of this report.

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 subject 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 report on Cycle III⁶ describes in detail the faithfulness with which the sampling design was carried out.

Data recorded for each sample youth are inflated in the estimation process to characterize the larger universe of which the sample youth is representative. The weights used in this inflation process are a product of the reciprocal of the probability of selecting the youth, an adjustment for nonresponse 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 12 through 17 for the youths' survey.

In the third cycle of the Health Examination Survey (as for the children in Cycle II) 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 youth from the eligible persons. The

probability of selecting an individual 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 youths 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 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 youths in a sample PSU having the same age (in years) and sex as youths not examined in that sample PSU.

The poststratified ratio adjustment used in the third cycle 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 makes the final sample estimates of population agree exactly with independent controls prepared by the Bureau of the Census for the U.S. noninstitutional population as of March 9, 1968 (approximate midsurvey point for Cycle III), by color and sex for each single year of age 12-17. The weight of every responding 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 youths not examined at all, there were some whose examinations were incomplete in one frequency or another. If the technician considered some parts of the test unreliable because of physical or mental reasons or because the audiometer was not functioning properly, the test parts affected were not used. The extent of missing data for the hearing tests is shown in table I.

For each of the examined youths not given the hearing test, a respondent of the same age-sex-race group was selected at random and his test results were assigned to the nonexamined person.

When only incomplete test results were available (38 youths), a variety of methods were used, depending upon the extent of missing data. If only one ear was tested, it was assumed that the findings for the other ear would have been the same. If partial results were available, the levels reached by the other ear at the particular frequencies were used as the estimates if they were consistent with the audiogram for the ear on which data were missing. Otherwise, projections were made on the basis of the parts of the audiogram available.

No attempt was made to estimate findings for the 3 youths not given the ENT examination, the 38 with no medical history related to

Table I. Missing hearing test data, by age of examinee: Health Examination Survey, 1966-69

Hearing test missing	All examinees, 12-17 years	12 years	13 years	14 years	15 years	16 years	17 years
All frequencies (number of youths for whom one or more test parts are incomplete)	38	7	8	5	8	6	4
		Number of ears					
Test incomplete for frequencies of:							
250 Hz	45	7	10	5	10	10	3
500 Hz	45	8	8	5	11	10	3
1000 Hz	46	8	8	5	10	12	3
2000 Hz	46	8	8	6	10	10	4
3000 Hz	47	8	11	5	10	10	3
4000 Hz	48	9	10	5	10	10	4
6000 Hz	46	7	10	5	12	10	2
8000 Hz	52	9	12	7	12	10	2

hearing or ear problems from the parent, and the 10 youths who did not complete this part of their health history. Rather, it was assumed that the distribution of the findings among these youths would be similar to that for youths with complete examination and history.

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.¹⁶ 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.” “Other” 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 other nonwhite 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 Bureau of the Census, were as follows:

<i>Region</i>	<i>States included</i>
Northeast.	Maine, Vermont, New Hampshire, Massachusetts, Connecticut, 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

Urban—rural.—The definition of urban-rural areas was the same as that used in the 1960 census. According to this definition, the urban population was comprised of all persons living in (a) places of 2,500 inhabitants or more incorporated as cities, boroughs, villages, and towns (except towns in New England, New York, and Wisconsin); (b) the densely settled urban fringe, whether incorporated or unincorporated, of urbanized areas; (c) towns in New England and townships in New Jersey and Pennsylvania which contained no incorporated municipalities as subdivisions and had either 2,500 inhabitants or more, or a population of 2,500 to 25,000 and a density of 1,500 persons or more per square mile; (d) counties in States other than the New England States, New Jersey, and Pennsylvania that had no incorporated municipalities within their boundaries and had a density of 1,500 persons or more per square mile; and (e) unincorporated places of 2,500 inhabitants or more not included in any urban fringe. The remaining population was classified as rural.

Urban areas are further classified by population size for places within urbanized areas and other urban places outside urbanized areas.

Family income.—The income recorded was the total income of the past 12 months received 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 in the case of a family with their own farm or business, in which case net income was recorded.

Parent.—A parent was the natural parent or, in the case of adoption, the legal parent of the child.

Guardian.—A guardian was responsible for the care and supervision of the child. He

(or she) did not have to be the legal guardian to be considered the guardian for this survey. A guardianship could only exist when the parent(s) of the child did not reside within the sample household.

Head of household.—Only one person in each household was designated as the “head.” He (or she) was the person who was regarded as the “head” by the members of the household. In most cases the head was the chief breadwinner of the family, although this was not always true. In some cases the head was the parent of the chief earner, or the only adult member of the household.



APPENDIX III

HISTORY AND RECORDING FORMS

A. MEDICAL HISTORY OF YOUTH—PARENT'S QUESTIONNAIRE

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.

25. Have his (her) ears ever been damaged or injured in any way?

1 Yes 2 No

IF YES: In what way? _____

26. Have his (her) ear drums ever been opened or lanced?

1 Yes x No

IF YES:

a. How many times: 1 Once 2 More than once

b. In which ear? 1 Left 2 Right 3 Both 4 I don't remember

27. Has he or she ever had any other kind of ear operation?

1 Yes 2 No

↓
IF YES: a. What was it for? _____

b. Which ear? _____

28. Has he or she ever had a running ear or any discharge from the ears (*except wax in the ears*)?

1 Yes x No

↓
IF YES:

a. How often? 1 Once 2 More than once

b. From which ear? 1 Left 2 Right 3 Both 4 I don't remember

29. In the past year has he or she had an earache?

1 Yes 2 No

30. Does he or she have any difficulty hearing?

1 Yes 2 No

31. Has he or she had any other ear trouble?

1 Yes 2 No

↓
IF YES: What? _____

B. HEALTH HABITS AND HISTORY—YOUTH

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

HES

Sample No.

HEALTH HABITS AND HISTORY — Youth

Name <i>(Last, First, Middle)</i>	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."

14. Do you have any difficulty hearing?

1 Yes 2 No

15. Were your ears ever damaged or injured in any way?

1 Yes 2 No 3 Don't know

a. IF YES: In what way and when? _____

16. In the past year, how often did you have earaches?

- 1 Not at all (*I can't remember any*)
2 Not very often (*about once a month or less*)
3 Quite often (*more than once a month*)

17. Have you ever had any other kind of trouble with your ears?

1 Yes 2 No

a. IF YES: What was it? _____

C. RECORDING FORM FOR ENT EXAMINATION

HEALTH EXAMINATION SURVEY—III

ENT EXAMINATION

EXTERNAL EAR (Except Canal)	<table style="width: 100%;"> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">L</td> </tr> <tr> <td>1 <input type="checkbox"/></td> <td>1 <input type="checkbox"/> NO FINDINGS</td> </tr> <tr> <td>2 <input type="checkbox"/></td> <td>2 <input type="checkbox"/> FINDINGS →</td> </tr> </table>	R	L	1 <input type="checkbox"/>	1 <input type="checkbox"/> NO FINDINGS	2 <input type="checkbox"/>	2 <input type="checkbox"/> FINDINGS →	<table style="width: 100%;"> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">L</td> </tr> <tr> <td>1 <input type="checkbox"/></td> <td>1 <input type="checkbox"/> OPERATIVE SCAR</td> </tr> <tr> <td>2 <input type="checkbox"/></td> <td>2 <input type="checkbox"/> OTHER (Describe): _____</td> </tr> </table>	R	L	1 <input type="checkbox"/>	1 <input type="checkbox"/> OPERATIVE SCAR	2 <input type="checkbox"/>	2 <input type="checkbox"/> OTHER (Describe): _____
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1 <input type="checkbox"/>	1 <input type="checkbox"/> NO FINDINGS													
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1 <input type="checkbox"/>	1 <input type="checkbox"/> OPERATIVE SCAR													
2 <input type="checkbox"/>	2 <input type="checkbox"/> OTHER (Describe): _____													

AUDITORY CANAL	Occluded: <table style="width: 100%;"> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">L</td> </tr> <tr> <td>1 <input type="checkbox"/></td> <td>1 <input type="checkbox"/> PARTIALLY</td> </tr> <tr> <td>2 <input type="checkbox"/></td> <td>2 <input type="checkbox"/> COMPLETELY</td> </tr> </table>	R	L	1 <input type="checkbox"/>	1 <input type="checkbox"/> PARTIALLY	2 <input type="checkbox"/>	2 <input type="checkbox"/> COMPLETELY	Occluded By: <table style="width: 100%;"> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">L</td> </tr> <tr> <td>1 <input type="checkbox"/></td> <td>1 <input type="checkbox"/> CERUMEN</td> </tr> <tr> <td>2 <input type="checkbox"/></td> <td>2 <input type="checkbox"/> OTHER (Describe): _____</td> </tr> </table>	R	L	1 <input type="checkbox"/>	1 <input type="checkbox"/> CERUMEN	2 <input type="checkbox"/>	2 <input type="checkbox"/> OTHER (Describe): _____
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2 <input type="checkbox"/>	2 <input type="checkbox"/> COMPLETELY													
R	L													
1 <input type="checkbox"/>	1 <input type="checkbox"/> CERUMEN													
2 <input type="checkbox"/>	2 <input type="checkbox"/> OTHER (Describe): _____													

DRUM	<table style="width: 100%;"> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">L</td> <td style="text-align: center;">R</td> <td style="text-align: center;">L</td> </tr> <tr> <td>1 <input type="checkbox"/></td> <td>1 <input type="checkbox"/> DULL (OPAQUE)</td> <td>1 <input type="checkbox"/></td> <td>1 <input type="checkbox"/> RED</td> </tr> <tr> <td>2 <input type="checkbox"/></td> <td>2 <input type="checkbox"/> TRANSPARENT</td> <td>2 <input type="checkbox"/></td> <td>2 <input type="checkbox"/> OTHER DISCOLORATIONS</td> </tr> <tr> <td>1 <input type="checkbox"/></td> <td>1 <input type="checkbox"/> BULGING</td> <td>1 <input type="checkbox"/></td> <td>1 <input type="checkbox"/> FLUID</td> </tr> <tr> <td>2 <input type="checkbox"/></td> <td>2 <input type="checkbox"/> RETRACTED</td> <td></td> <td></td> </tr> <tr> <td>1 <input type="checkbox"/></td> <td>1 <input type="checkbox"/> CALCIUM PLAQUES</td> <td></td> <td></td> </tr> </table>	R	L	R	L	1 <input type="checkbox"/>	1 <input type="checkbox"/> DULL (OPAQUE)	1 <input type="checkbox"/>	1 <input type="checkbox"/> RED	2 <input type="checkbox"/>	2 <input type="checkbox"/> TRANSPARENT	2 <input type="checkbox"/>	2 <input type="checkbox"/> OTHER DISCOLORATIONS	1 <input type="checkbox"/>	1 <input type="checkbox"/> BULGING	1 <input type="checkbox"/>	1 <input type="checkbox"/> FLUID	2 <input type="checkbox"/>	2 <input type="checkbox"/> RETRACTED			1 <input type="checkbox"/>	1 <input type="checkbox"/> CALCIUM PLAQUES			Perforated: <table style="width: 100%;"> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">L</td> </tr> <tr> <td>1 <input type="checkbox"/></td> <td>1 <input type="checkbox"/> WITH DISCHARGE</td> </tr> <tr> <td>2 <input type="checkbox"/></td> <td>2 <input type="checkbox"/> WITHOUT DISCHARGE</td> </tr> <tr> <td>1 <input type="checkbox"/></td> <td>1 <input type="checkbox"/> SCARS</td> </tr> </table>	R	L	1 <input type="checkbox"/>	1 <input type="checkbox"/> WITH DISCHARGE	2 <input type="checkbox"/>	2 <input type="checkbox"/> WITHOUT DISCHARGE	1 <input type="checkbox"/>	1 <input type="checkbox"/> SCARS
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3 <input type="checkbox"/>	3 <input type="checkbox"/> NOT VISIBLE																																	
1 <input type="checkbox"/>	1 <input type="checkbox"/> OTHER FINDINGS (Describe): _____																																	

DRUM MOBILE	
R	L
1 <input type="checkbox"/>	1 <input type="checkbox"/> YES
2 <input type="checkbox"/>	2 <input type="checkbox"/> NO
3 <input type="checkbox"/>	3 <input type="checkbox"/> PNEUMATIC OTOSCOPY UNSATISFACTORY

TONSILS:
1 <input type="checkbox"/> NOT VISIBLE
2 <input type="checkbox"/> TONSILLAR TAGS PRESENT
3 <input type="checkbox"/> TONSILS PRESENT—GRADE I <small>(Within Tonsillar Pillars)</small>
4 <input type="checkbox"/> TONSILS PRESENT—GRADE II <small>(Outside Tonsillar Pillars but not Meeting in Midline)</small>
5 <input type="checkbox"/> TONSILS PRESENT—GRADE III <small>(Meeting in Midline)</small>

ORAL PHARYNX
1 <input type="checkbox"/> NO FINDINGS
2 <input type="checkbox"/> FINDINGS (Describe): _____

NARES	
R	L
1 <input type="checkbox"/>	1 <input type="checkbox"/> NO FINDINGS
2 <input type="checkbox"/>	2 <input type="checkbox"/> FINDINGS →

OBSTRUCTION:	
R	L
1 <input type="checkbox"/>	1 <input type="checkbox"/> ACUTE
2 <input type="checkbox"/>	2 <input type="checkbox"/> CHRONIC

OTHER SIGNIFICANT FINDINGS:	
R	L
1 <input type="checkbox"/>	1 <input type="checkbox"/> NO
2 <input type="checkbox"/>	2 <input type="checkbox"/> YES (Describe) _____

APPENDIX IV

STANDARDS FOR REFERENCE (AUDIOMETRIC) ZERO

The sound pressure standards for "normal" auditory threshold—the 1951 American Standards Association audiometric zero—maintained by the National Bureau of Standards were derived from data of the National Health Survey of 1935-36, as described previously. The original measurements were determinations of voltages applied at the terminals of the audiometer earphones used in the survey for a subgroup of persons with "normal" hearing. These threshold data were transferred by loudness balancing to a group of standard earphones designed especially for stability in calibration—the Western Electric 705-A. After loudness balancing, the earphones were placed on an NBS 9-A standard calibrating coupler and their response was measured.

Later, and in a similar fashion, the National Bureau of Standards transferred the threshold from the Western Electric 705-A earphone to five other types of earphones.

The threshold standard in terms of sound pressure in a standard coupler will be valid for the earphones of these types, provided that the earphone cushions are of controlled profile, thickness, and compliance; that the distance from the front of the face of the moving diaphragm to the plane of the cushion is held constant; and that the earphone is held against the ear with a

constant coupling force.^{17,18} They will not apply to earphones of other types.

The transfer characteristics for the TDH-39 earphones MX-41/AR cushions used in this survey were those determined for the Health Examination Survey instruments at the University of Pittsburgh¹⁹ to replace those previously suggested by Allison Laboratories.²⁰

The new (1964) standard reference zero recommended by the International Organization for Standardization (ISO)^{11,21-24} was adopted in the 1969 American National standard for audiometers during conduct of this survey to replace the differing 1951 American and the 1954 British Standards.²⁵ Since these new standards are appearing in many of the journals and other technical publications, the comparison of them with the 1951 American Standard on the 705-A earphones and the TDH-39 earphones used in this survey is shown in table II.

The thresholds for the 1951 American Standard and the recommended ISO Standard on the 705-A earphones are rounded to the nearest 0.5 dB in accordance with the ISO method of presentation. The TDH-39 thresholds are retained in the form used to convert the findings from this survey to decibels re 0.0002 dyne per square centimeter, as shown in the section, "Comparison With Previous Findings."

Table II. Comparison of 1951 American Standard and the recommended ISO Standard for reference zero

Frequency	1951 American Standard for reference zero of:		Recommended ISO Standard for reference zero of WE-705-A earphones ¹
	WE-705-A earphones ¹	TDH-39 earphones ¹	
	Decibels re 0.0002 dyne per square cm		
250 cps	39.6	45.4	24.5
500 cps	25.0	30.0	11.0
1000 cps	16.5	22.6	6.5
2000 cps	17.0	21.8	8.5
3000 cps	² 16.0	26.7	7.5
4000 cps	15.0	16.9	9.0
6000 cps	² 17.5	23.9	8.0
8000 cps	20.9	26.5	9.5

¹ On NBS 9-A coupler. TDH-39 earphone reference values shown here are those determined for the Health Examination Survey instruments at the University of Pittsburgh.¹⁹ The other two sets were determined by averaging many different determinations from many different countries, available from the National Bureau of Standards.

² Estimated.

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