

**INCIDENCE OF SPEECH & HEARING DISORDERS IN INDIA**  
**A CRITICAL REVIEW OF STUDIES**

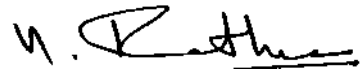
**Reg. No.9**

**An Independent Project submitted as part fulfilment for  
M.Sc (Previous) (Speech & Hearing), 1981**

**University of Mysore  
Mysore 570006**

## CERTIFICATE

This is to certify that the Independent Project entitled '**INCIDENCE OF SPEECH AND HEARING DISORDERS IN INDIA - A CRITICAL REVIEW OF STUDIES**' is the bonafide work done in part fulfilment for MSc (Previous) (Speech & Hearing) of the student with Register No. 9..

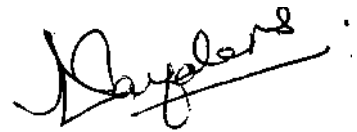


Director

All India Institute of  
Speech and Hearing,  
Mysore 6.

## **CERTIFICATE**

This is to certify that the Independent Project entitled '**INCIDENCE OF SPEECH AND HEARING DISORDERS IN INDIA - A CRITICAL REVIEW OF STUDIES**' has been prepared under my supervision and guidance.

A handwritten signature in black ink, appearing to read 'Nayab', written over a horizontal line.

**GUIDE**

## DECLARATION

This Independent Project entitled **"INCIDENCE OF SPEECH AND HEARING DISORDERS IN INDIA - A CRITICAL REVIEW OF STUDIES"** is the result of my work undertaken under the guidance of Mr. Jesudas Dayalan Samuel, Lecturer in Audiology, All India Institute of Speech and Hearing, Mysore 570006, and has not been submitted at any University for any other Diploma or Degree

Mysore

Register No.9

Dated:

## **ACKNOWLEDGEMENTS**

I sincerely thank Mr. Jesudas Dayalan Samuel, Lecturer in Audiology, for his invaluable guidance.

I also thank the Director and the Head of the Department of Audiology, All India Institute of Speech and Hearing, Mysore, for allowing me to do this Project.

My thanks are due to my friends in general and classmates, in particular, who helped me to do this work.

Finally I acknowledge Mr. M.H. Sanjeeva Murthy, who typed the Project.

## CONTENTS

- 1-3 - IMPORTANCE OF COMMUNICATION
  
- 4 - DEFINITIONS:  
PREVALENCE  
INCIDENCE
  
- 6-1 - INCIDENCE OF SPEECH & HEARING DISORDERS AROUND  
THE WORLD
  
- 8-9 - INCIDENCE OF SPEECH & HEARING DISORDERS IN  
INDIA
  
- 10-36 \_ REVIEW OF STUDIES
  
- 37-39 \_ SUMMARY & CONCLUSIONS
  
- REFERENCES
  
- APPENDIX ( Table showing studies done in India,  
in brief)

## IMPORTANCE OF COMMUNICATION

Communication is an integral feature of interaction between organisms. It occurs whenever the behaviour of one organism acts a stimulus for the behaviour of another. The behaviour of one organism acts as a stimulus and a second organism, because of inborn make up of its nervous system or because of neural changes that have resulted from learning, responds appropriately to the stimulation provided (Munn, 1967).

Most human interaction involves language which may be defined in the simplest terms as, communication with gestures or with spoken or written words. Speech symbols are conventionalised, bound by rules, involving stimuli which signify something that is understood, more or less, by both the person who initiates them and the person for whom they are intended. A message gets across because the sender encodes his message according to custom and the receiver decodes it in the same terms. Communication involves a chain with at least three major links - a sender, a communication channel and a receiver.

A human child learns to speak or communicate only when

the chain is completely intact. That is, a child has to receive a message, understand the message and then express the message. Any disruption in the process leads to non-learning of verbal behaviour and more so if it occurs during critical period of speech acquisition.

For example, a child who cannot receive the messages during early childhood is deprived of the meaning of the messages and thus, the ability to understand the message and store the message and reproduce the message at an appropriate time is lost, thus, the expression and reception are lying at a very low level compared to a child who has the ability.

A hard of hearing child faces the same problem as mentioned above. Because of the inherent hearing loss which makes the child unable to receive the environmental, verbal stimulation, the child is not exposed to various verbal stimulations and feelings which are essential for the child to learn to communicate effectively with his surroundings.

On the other hand, a child who receives the message or stimulation but cannot express the message effectively, may not have a serious problem even though he is communicatively handicapped.



Thus any handicap in communication either in reception or expression makes an individual's life miserable in society.

## DEFINITIONS

**Prevalence**: Prevalence would reflect the extent of trait or tendency or affliction in a given population. It enables one to have a bird's eye view of magnitude of a characteristic, i.e., either normal or deviant from normality of a given population in general.

**Incidence** ; Incidence of a problem or trait or tendency in a given population demonstrates the trait, tendency or affliction present in that population at a given time. It does not take into account the subsequent alterations the trait, or tendency or affliction undergoes.

In cross section of studies two incidence figures will always be higher than the prevalence ones reported.

Prevalence figures are obtained by cross-sectional studies whereas, true incidence figures are obtained by longitudinal studies.

## INCIDENCE OF SPEECH & HEARING DISORDERS AROUND THE WORLD

The prevalence and incidence of hearing loss individuals in any given society is conspicuous depending upon the prevailing geographical, social, cultural and educational conditions. Various attempts have been made in many parts of the world to find the number of communicatively afflicted persons so that, proper rehabilitative programmes could be initiated.

In United States of America, according to the latest statistics of U.S. Office of Education (Annual Survey of Hearing Impaired Children and Youth, United States, 1973), there are three in every 4,000 children aged between 5 to 19 years who are deaf (91 dB ISO hearing loss or greater in better year) and 1 in every 200 who are hard of hearing (Oyer and Hardick, 1976. ).

In Canada, no definite study has been done to find out prevalence and incidence of hearing and speech problems. Wallace (1973) in his report, observed that, "there was complete lack of definitive ongoing studies on the size, characteristics and location of the deaf population" (Clarke and Kendall, 1976 ).

In Argentina, total number of deaf children, excluding the mild hypocusis but including deep peripheral deaf, aphasics and children with other types of syndromes related to deafness and mutism, is estimated to be approximately 80,000, i.e., 8.5% of the population under 14 years of age. (Tosi, 1976).

In United Kingdom and Ireland, many studies have been done to focus the attention of the Government and other agencies to ameliorate conditions of the deaf. In a follow-up studies of 16,000 children born in March 1958 (National Child Development Study, Cohart, 1958), Devie, 1972, reported that 5.7% had losses in excess of 35 dB on at least two frequencies. Of these, 4.2% of the total sample had a loss in one ear only. Of children with bilateral losses, 1.3% had losses in the range of 35 dB, 0.2% had losses in the range of 55 - 70 dB and 0.1% had losses of 75 dB (Murphy, 1976. ).

In Sweden, the size of the problem is not apparent but can be estimated for the population. Past experience and present knowledge from Western countries have enabled to predict the number of the total population needing audiological services of any kind, i.e., with socially significant hearing loss, is approximately 4%, whereas, profound prelingual deafness

in children is thought to be on the order of 1 to 2 per 1,000 live births (Lemdborg, 1976 ).

In Austria, Federal Republic of Germany and Switzerland, the population of deaf children, when compared to the total school population, amounts to approximately 0.04% (Lowe, 1976. ).

In Poland, on a study of 10,000 school children from Wola District in Warsaw, in 1963, it was found that one child in 1,000 had a moderately severe hearing impairment and 13 in 1,000 had moderately severe hearing disorders associated with infections of upper respiratory tract (Gaertig, 1976 ).

From the above, one can make out the magnitude and extent of the prevalence and incidence of Speech and Hearing disorders which pose a serious problem and which need immediate attention so as to alleviate the conditions of these handicaps.

## INCIDENCE OF SPEECH & HEARING DEFECTS IN INDIA

In India, where population is of the order of 70 crores, the magnitude of prevalence and incidence of hearing and speech handicaps is unimaginable. To the date, no accurate prediction of prevalence and incidence of communication disorders is made even though many people tried to localize their efforts.

As early as in 1931, when first National Census was conducted, an effort had been made to find out the incidence of hearing and speech handicaps, but with no definite results. In 1962, Dr. Martin F. Palmer, an American Speech Pathologist and Audiologist was invited by the Government of India to suggest various measures in the rehabilitation of hearing and speech handicapped. He visited various places in India and collected certain information and came to a conclusion that about 6% of the general population suffer from communication disorders. Though it is a rough estimate, one has to agree to the magnitude of the problem since the same has been found to be true in other countries. In our country, the incidence may be of higher order than reported by Dr. Palmer because of the prevailing socio-economic conditions and various other reasons. Any how this report has opened a new

era in rehabilitation of communicatively handicapped. Since then, quite a few enthusiastic ENT doctors and others have conducted surveys in order to focus the attention of the Government into this humane problem.

Since 1962, many studies have been done as reported earlier at various places to definitely know the magnitude of the problem, but with little success. Various studies and surveys have been conducted at various places with mostly non-standardized equipment and procedures. Many of the studies had no definite research design and results obtained from various studies were conflicting and unreliable. Most of the studies are discussed individually elsewhere in this review.

## A STUDY OF HEARING LOSS IN SCHOOL CHILDREN IN INDIA

- Y.P. Kapur (1965)

Since no information was available concerning either hearing disorders or the incidence of hearing loss among school children in India, and so far as is known, no adequate surveys have been undertaken, this survey was chosen in order to find prevalence and incidence of hearing loss among school going population. This survey was conducted among children in three schools in the Vellore Town, South India.

Subjects: 857 children tested in these three schools were between five and fifteen years of age and adequately represented the socio-economic background of the school population of the region.

Equipment: Two Amplivox Audiometers (Model 82-C) calibrated to British Audiometric Zero (Year not mentioned), and fully tropicalized, were used to carry out hearing evaluation. Frequent biological calibration was carried out to ensure the optimum consistency and efficiency.

Test environment; Test environment was fairly good and conducive for carrying out audiometric evaluation.



Procedure: Children were conditioned to pure tones and then thresholds were obtained at 250 Hz, 500 Hz, 1000 Hz, 2,000 Hz, 4,000 Hz, 6,000 Hz and 8,000 Hz. Before carrying out audiometric evaluation, each child was subjected to thorough ENT examination and condition of the ears was noted accordingly.

Results: A study of the figures obtained from three schools shows that the prevalence of hearing loss in the 857 children examined, varied from 16.3% to 18.6%, depending upon the school. Furthermore, 14.6% to 17.5% of school children had conductive hearing loss, a type of loss which can be treated and in many cases, the loss can be reversed.

Discussion: The survey has followed certain specific ways of conducting a study. The sample selected is fairly large and a replicative study would have strengthened the findings of the present study. However, the results would call for an urgent need for further surveys in various parts of the country to achieve a coordinated and concerted effort on the part of all people to help in hearing conservation.

## HEARING STUDIES IN LUCKNOW

- M.L. Bhatia (1966)

This study was done on patients who visited outpatient department of ENT Department of Government Medical College, Lucknow, Utter Pradesh.

Subjects: A cursory analysis of a random sample of 3,000 audiograms of hard of hearing patients was done. An average of 1,200 cases were audiologically examined every year.

### Method:

Hearing Evaluation: Hearing Evaluation was done by obtaining only pure tone thresholds. The levels of measurement were not mentioned.

Equipment: Amplivox Audiometer was used (Make of which was not given).

Results: Results of the study reveal that a large number of cases are those who have a high degree of hearing loss. Table below illustrate the findings.

Mild Deafness (Upto 25 dB)	28%	Conductive	-	29.5%
		Mixed	-	42.1%
		Sensorineural		28.4%
Moderate Deafness (Between 25 dB - 50 dB)	31%	Conductive	-	5.2%
		Mixed	-	39.3%
		Sensorineural		49.3%
Severe Deafness (Above 50 dB)	41%	Conductive	-	5.2%
		Mixed	-	5.5%
		Sensorineural		89.3%

Discussion: Fairly well defined study with some clear idea in what has to be done. The rating scale could have been more broad to accommodate functionally handicapped and non-functionally handicapped. Test procedure should have been more elaborate and specific. If the study had been done by trained clinical hands, reliability and validity of the study would have been more. Break-ups of males and females were not given. Age-wise break-up was also absent. These would rather give a benefit of doubt with respect to the results obtained.

## HEARING STUDIES IN MADURAI

- Kameswaran, S.(1967)

This investigation had been conducted in three parts. First, school going children in Madurai city were covered. Later, it was shifted to an exhibition at a nearby town called Virudhnagar and later to a rural area called Varichiyur, a centre adopted by the Madurai Medical College for rural relief.

Subjects: 2,000 school going children, which on statistical evaluation, was equivalent to the screening of 1,25,000 school children, were tested in Madurai. in Virudhnagar, 221 cases were seen and in Varichiyur, 194 cases were seen.

Equipment used was not mentioned.

Test environment was not specified.

Results: Prevalence of hearing loss found in the three studies is as follows:

Among 1,886 school children, 460 children were found to have hearing loss, i.e., 3.5%.

Among 221 cases tested at Virudhnagar exhibition, 38 cases found to have hearing loss, i.e., 11.7%.

At Varichiyur Rural Medical Centre, among 194 cases, 69 cases was found to have hearing loss, i.e., 23.7%.

Discussion: Test environment and equipment used were not mentioned. No mention had been made about speech defects among the cases. There is no age-wise and sex-wise break-up.

The sample chosen was not large enough and a survey with clear objectives would have strengthened results from statistical point of view. In general, it is a cross-sectional study.

## HEARING STUDIES IN KAKINADA

- Jain, S.N. (1967)

This is a study done in 1967 in the town of Kakinada in Andhra Pradesh. The study has been done in order to focus the attention of various Government agencies and voluntary bodies into the problem of hearing impairment among school going children.

Subjects: Subjects included about 5,000 children from 11 schools from both municipal as well as private schools. Sample presented a fairly cross section of children, age ranging from 5 to 19 years and also matched as far as social status, sex, etc.

Method: Prior to conducting the survey, as part of the survey, questionnaires were sent for the parents of the children studying in various schools to obtain information about the socio-economic status of the family and also about the performance of the children in the school. Information was also obtained about the childrens previous and present history of health.

Hearing evaluation: Hearing evaluation was carried out by using tuning fork tests - Rinne and Weber with 256 Hz and

512 Hz. Whisper Voice Test was carried out in individual cases from a distance of 20 feet, using numbers and simple words. Responses were noted accordingly.

Test environment: Relative quiet surrounding was chosen for the purpose of hearing evaluation. Ambient noise levels were not mentioned.

Results: Results showed that out of 4,720 children tested, only 5 children had speech defects. Type of speech defect and severity of speech defect was not reported. Majority of the children (1,747) required immediate attention for ear infections.

Discussion: The sample chosen was large but not randomized. This gives rise to a subjective bias deriving its strength from social, cultural and economic backgrounds. There is no break-up for boys and girls and age-wise also. Test had been done in a situation whose ambient noise level had not been mentioned. This is a great draw-back since evaluating hearing in noisy surroundings would help individuals with mild to moderate conductive hearing loss to pass the screening tests. A significant point is that tuning forks have been used to conduct hearing study. As everybody is aware, by tuning forks, the

hearing loss cannot be quantified though the type of loss can be assessed. It is rather surprising why author shows tuning fork tests and whisper voice tests when they have been discarded long ago to accommodate well developed electric and electronic audiometers. The professional competency of the investigator or the persons who have conducted the study has not been reported. This gives rise to a lot of inter-subject and intra-subject variability which one should keep in mind while conducting any study. What is rather amusing is that, one tries to come to a conclusion about the results and predicting the same on general school population of that region. The author has utterly failed in the study by not taking into consideration better diagnostic tools which were available and which could have enhanced the efficacy of the survey. The results obtained lack both quality and quantity.



## HEARING STUDIES IN VARANASI

O.P. Gupta (1967)

The investigator chose the above topic for a study in order to focus on many problematic aspects of the hearing conservation and prevention of deafness in our country.

Subjects: 3,504 school children were examined. Break up for boys and girls being 2,491 and 1,013. Age range mentioned was conflicting.

Method: Children were tested at their respective schools by a "Research Fellow" who was employed for the purpose. The qualification of the Research Fellow was not mentioned. The hearing was assessed by conventional method of testing hearing, i.e., tuning forks, conversational speech and whispers. Audiometric screening could not be done. Children found to have severe hearing loss were brought to the out patient department for audiometric check up. Levels employed for testing hearing thresholds were not mentioned. No attention was paid to the speech behaviour of children.

Results: Out of 3,504 children, 2,114 had some form of ear involvement. Of these, 2,114, 1,241 (35.4%) children

showed mild degree of hearing loss. Moderate deafness was found in 156 (4.3%) children.

The results are not clear and fail to focus on which aspect one should look into.

Discussion: The author had conducted the study with full knowledge that he has flouted the "statistics". He was fully aware of the limitations of the study at each level. The author felt that random sampling of children, matching the age groups in all respects had been done but in reality, it is not so. The age range reported is conflicting because at one place the author mentioned school children and at some other time, adults.

It is unfortunate that one should conduct a study fully realising the draw backs. An attempt should have been made to minimise the pitfalls to make the study more constructive and realistic.

The out-dated Audiometric Screening was not done, instead, conventional tests like tuning forks, conversational speech and whisper voice test were preferred'.

**RURAL SURVEY FOR SPEECH AND HEARING DEFECTS AT  
VILLAGE BHARTHAL**

- Abrol, et al (1971)

A rural speech and hearing survey was organised by the rehabilitation unit of Audiology and Speech Pathology, All India Institute of Medical Sciences, New Delhi, with the help of Indian Council of Social Welfare, on 29th March 1970 at a Village Bharthal which comes under Union Territory of Delhi.

Subjects: 2,300 people (population of the village) were tested. Majority belonged to lower socio-economic group with poor literacy level.

Method: All the cases were subjected to thorough Ear, Nose and Throat examination, before audiometry could be done.

Equipment used: Transistorised Arphi Audiometer model MK II was used.

Hearing evaluation: Hearing evaluation was carried out on all the subjects. Procedure employed was not mentioned. Hearing was tested at different Sound Pressure Levels.

Discussion: For any investigator, before conducting a

survey or study, a clear and simple design of the same must be worked out which should be feasible. The author had no clear design in his mind when the study was conducted. This amounts to flouting of statistical methodology when trying to put in the results obtained in a frame work. It appears as if the author decided to test the people and then depending upon the results obtained, he tried to put the same into an acceptable form in which he utterly failed. Though the sample chosen is large enough, there is no sex-wise break-up or age-wise break-up. Though the study mainly attempted to find out speech and hearing defects, most of the subjects ended up with ENT problems like CSOM, AOM, etc., which contribute to the deficient functioning of hearing. It is surprising the author shows different sound pressure levels to establish hearing thresholds. The audiometric procedures were not comprehensive and it is unfortunate that better diagnostic tools and professionals available at a place like New Delhi, could not have been used.

## **NAGUVANAHALLI SCREENING - A PILOT PROJECT**

**- N.S.Viswanath et al (1971)**

The village Naguvana Halli is about nine miles from Mysore City which was devoid of any medical facilities. Hence, the authors thought it would be appropriate to conduct a hearing and speech screening programme among the school going population of the village.

Subjects: 410 school going children in the age range of 5-16 years, distributed from primary level to secondary level of education, were tested for speech and hearing problems.

### **Hearing Evaluation**

Method: Hearing evaluation was done at 500 Hz, 1000 Hz, 2000 Hz and 4000 Hz, presentation levels being 30 dB, 20 dB, 20 dB and 20 dB. These levels were earlier validated on 50 normal children with normal ENT findings.

Equipment: Two portable Beltone 12-D audiometer, calibrated to ISO 1964 standards were used.

Test environment: Test rooms were reasonably quiet though not sound treated.

Results: Out of 410 children examined, 18.9 percent had hearing problems. Breakdown for boys and girls were 19.3 percent and 18.19 percent.

### Speech Evaluation

Method: Initially, peripheral speech mechanisms were examined for any possible gross deviations. Later, two Kannada passages from a popular Kannada magazine were used as test material. Suitable grade children were given accordingly complex passages.

Results: It was observed that only 3.9% of 410 children had speech problems. Boys constituted 5.3 percent and girls 1.3 percent.

Discussion: Though the screening programme tried to maintain certain parameters in conducting a study, use of non-standardized material gives rise to sufficient ambiguity with regard to results obtained. It is necessary that prior to conducting screening programme, an initial study about the scholastic levels of the students in general would have helped to construct better test materials.

## SCHOOL SCREENING PROGRAMME IN MYSORE CITY

- Shailaja Nikam (1971)

The present study had been done to find out the prevalence of hearing loss and speech defects among school going children of various schools in Mysore City, South India.

The purpose of the study was many a fold, i.e., (a) Case finding, (b) arriving at a blue print for efficient and economic school screening procedures, (c) providing training ground for students at All India Institute of Speech and Hearing, (d) creating greater awareness in the community regarding Speech and Hearing problems.

Subjects: In all, 2,086 school going children, in the age range of 2-14 years, from 12 schools were taken for testing.

Method: These children were tested individually. Each child was conditioned to sound before audiometry could be performed. Later, hearing was tested at three frequencies, i.e., 500 Hz, 1,000 Hz, 2,000 Hz and 4,000 Hz - these being speech frequencies, at 30, 20, 20, and 20 dB SPLs. (ISO).

Test environment: Testing was done in a room considered to be reasonably quiet. Ambient noise levels as measured by Sound Pressure Level meter (GR Type 1551-C) were 56 dB and 60 dB on the 'C Scale.

Equipment: Initially screening programme was done with a Amplivox-83 Audiometer and later, 2 Beltone 12-D Portable Audiometers were used.

ENT Examination: Ear, Nose and Throat examination of each child was done by a qualified ENT Doctor before the child was subjected to audiometric examination to rule out any external ear or middle ear pathologies.

Speech Evaluation: Speech Evaluation was carried out on each child by qualified Speech Pathologists for any speech defect and if any defect was detected, it was noted accordingly. No definite procedures could be employed to assess the speech behaviour.

Results: Results indicated that out of total population tested, i.e., 2,086 children, only 82 children found to have hearing loss. Among them, 64 had bilateral conductive hearing loss and 14 children had unilateral conductive loss and remaining



equally divided between unilateral and bilateral sensori-neural loss. The incidence of hearing loss was found to be 3.9%.

The data analysed for the incidence in the various age groups showed that highest percentage was found to be among the three year olds (26.66%), 14 year olds coming next (12.5%). Reasons attributed to various middle abnormalities due to improper health care and unhygienic living conditions.

Discussion: The sample chosen was not adequate to meet the criteria of random selection and the groups are not matched. Though enough pains have been taken to test a large sample, it is surprising that male-female break-up had not been done. When children were brought all the way from different schools to All India Institute of Speech and Hearing, for screening, the hearing thresholds could have been obtained in sound treated rooms straight away, where the ambient noise is attenuated to meet the specifications rather than testing in open rooms. The ENT examination does not throw light on various middle ear and external ear pathologies which would normally contribute for the deficient functioning of the ears. Main purpose of this programme was a case finding, hence, an attempt to estimate prevalence of hearing loss is hazardous.

On the other hand, a glance at the results would reveal that, depending upon the location of the school, the incidence of hearing loss may be low, moderate or high.

**HEARING SURVEY OF SCHOOL GOING CHILDREN IN  
BOMBAY CITY**

- Vijay Shah, et al (1971)

The purpose of the study was to detect the number of children having hearing loss in the school going population of Bombay City and offer necessary treatment and guidance to these children.

Subjects: 7,100 children were tested in the age range of 5 to 9 years, studying in 1st standard through 4th standard.

Method: Hearing evaluations of these children were conducted at their respective schools by junior Audiologists. Three frequencies and two intensity levels were used for screening, i.e., 500 Hz, 2,000 Hz, 4,000 Hz at 15 dB and 25 dB. Children with odd numbers were tested first in one year and those with even numbers were tested first in the opposite year to obtain efficiency. The series of stimuli used were 4 K, 2 K and 500 Hz at 25 dB and then 4 K, 2 K and 500 Hz at 15 dB. High frequencies were used first because, in a room which is not sound treated, high frequencies are perceived better than low frequencies. Any child who failed to respond at 4 K or 2 K at 15 dB, or at 500 Hz at 25 dB, was declared failed. These

children were referred to ENT Department of Sir J.J. Group of Hospitals for detailed audiometric examination, where comprehensive audiometry was done.

Test environment: The test was conducted in a quiet room, preferably on the top floor of the school. Ambient noise levels were not reported.

Results: Of the 7,100 children screened at the schools, 1,497 (21.08%) children were declared failed. Of the 1,497 failed, 61% belonged to various municipal schools. Majority of the children of these schools belonged to lower socio-economic strata of the society. Remaining 38.91% belonged to non-municipal schools, where children mostly belonged to higher socio-economic strata of the society.

Detailed audiometry of 1,113 students revealed that 859 children (75.68%) had mild hearing loss, 94 children (8.4%) had moderate hearing loss and 18 children (11.6%) had sensorineural hearing loss.

Discussion: Sample chosen here, though represents children from both higher and lower economic strata of society, the ratio is not proportional. Hence, the results might be biased in

favour of both groups. The study has followed, to a large extent, unambiguous procedure and the results obtained can be predicted to the general school population to a great extent. There were no clear demarkation of the number of boys and girls tested and also prevalence of hearing problems in each group even though incidence of mild hearing loss is given according to age group. It is observed from the results that there were more children with mild hearing loss as one goes from standard 1 to standard 4.

**RURAL SURVEY FOR ENT AND SPEECH AND HEARING DEFECTS  
AT VILLAGE CHHATERA**

- Abrol, B.M., et al (1972)

A rural Speech and Hearing Camp was organized by rehabilitation unit in Audiology and Speech Pathology, All India Institute of Medical Sciences, New Delhi, was conducted at Village Chhatera, which is about 15 Km from New Delhi. This camp was a part of the health camp conducted at the same time.

subjects: Out of 1,500 people who attended health camp, only 157 had ENT problems. Mostly these people belonged to low economic strata and poor literacy level.

Hearing evaluation: Hearing evaluation was done as part of general ENT check-up and it was found that a majority of cases had some ENT problem.

Equipment used: An audiometer was used to establish hearing thresholds (make and condition of audiometer was not reported).

Test environment: Testing was done in a room where ambient noise level measured 60 dB on B&K Precision Sound

Level Meter (model 158).

Results: Analysis of data showed that two cases with articulation defects and two cases of impairment of hearing with delayed development of speech and language, were detected.

Discussion: In the first place, it is not proper to club speech and hearing evaluation with other evaluations in a health camp, because, the speech and hearing evaluations are time consuming require proper attention. It can be well understood that in a health camp, the like mentioned above which lasts for a day or two, where many other evaluations have to be done, speech and hearing evaluation cannot be done comprehensively. The very aim of reaching the problem is lost when evaluations are carried out with non-standardized equipment and half-trained professionals. A point to be noted is that, with a very low socio-economic background, poor literacy level and absence of any hygienic conditions, the survey revealed only two cases with misarticulations and two cases of hard of hearing, which itself speaks for the efficacy of the procedures followed.

**PREVALENCE OF SPEECH PROBLEMS AMONG SCHOOL CHILDREN  
OF MYSORE CITY**

- Manohar and Jayaram(19 73)

This is a report of the analysis of the speech evaluation carried out from 17 December 1970 to 29 September 1972 in Mysore City to find an estimate of various speech problems in the school children, which was a part of the Screening Programme of the All India Institute of Speech and Hearing, Mysore.

Subjects: A total of 1,454 children were tested, out of which 707 were boys, 747 were girls drawn from eleven different schools in Mysore City, in the age range 3-16 years.

Method

Speech evaluation: Each child was tested for peripheral speech mechanism, articulation, voice, fluency and language. Speech evaluation was done by senior student trainees in both graduate and undergraduate levels, under the supervision of a Speech Pathologist. Mostly conversation was used to elicit speech from children. No definite standardized speech material was used. Even though for articulation testing, spontaneous speech and pictures were used no formal tests were employed to assess the language.



Test environment and equipment: Children were tested in one of the rooms of the Institute and no equipment was used.

Results: Analysis of data obtained revealed that 14.61% of school going children had speech problems. The incidence of speech problems was found to be higher in girls (15.79%) than boys (13.43%). Among the type of speech problems, dysphonia appeared to be of higher incidence. Among dysphonias, voice quality disorders found to be more (Table 1).

Discussion: Though an attempt has been made to test speech and language performance of large samples of school going children, it is surprising that no standardized speech material or language assessing material were used, thus giving rise to lot of inter and intra subject variability with respect to the responses that have been recorded. It is inappropriate to use student trainees as evaluators. It would have been more appropriate if the proficiency of student trainees in evaluating a case were done. It has not been reported that whether the children's hearing was within normal limits. This is a significant omission because many a time, hearing loss from mild to severe degrees would contribute to some amount of speech and language problem. It is also observed that while breaking down the statistical analysis of different

types of speech problems for both boys and girls, age range has not been matched. This results in unequal matching leading to ambiguous prediction of results. Though the results show the magnitude of prevalence of speech problems, from academic point of view, predicting the same for general school population would amount to violation of statistical rules.

## SUMMARY AND CONCLUSIONS

Most of the studies were aimed at prevalence of Speech and Hearing problems rather than incidence of Speech and Hearing problems, i.e., majority of the studies are cross-sectional rather than longitudinal.

In the first place, one should appreciate the efforts of various investigators who had shown keen interest and took pains in conducting the surveys or studies to focus the attention of all towards the prevailing Speech and hearing disorders among the general population.

Many of the studies have come out with figures, which are rather contradictory in nature, but one can estimate the magnitude of the problem. It is anybody's guess that a true incidence figures would be very high than the reported prevalence ones owing to the various reasons. These reasons may be improper techniques employed in the studies, for example, the research design used or the survey design used and non-standardization of procedures. Most of the investigators have used such methods which were convenient for them to conduct the studies or surveys completely ignoring the science of statistics. This can be understandable since the field of

Speech and Hearing was in its nascent stage and non-availability of technical persons and proper equipment at various hospitals and other places have also contributed to such type of studies.

Another point to be mentioned is that, majority of the studies had choice of equipment which were handled most of the times by non-professionals, thus giving rise to instrumental bias or error. A trained professional would look at a problem as it should be rather than a non-professional who looks at the problem because he is asked to do and his job is mechanical.

It can be noted from the studies that most of them only emphasize hearing as one entity ignoring contribution of hearing loss in causation of language and Speech defects. It is surprising that the prevalence of speech disorders is less compared to hearing disorders even though in reality, it is not so.

Not a single study has taken into consideration, the functional aspects of hearing even though more emphasize was on structural aspects of ears.

It is very difficult to come to a conclusion from the studies mentioned above about the true incidence of prevalence of

communication disorders because there is no uniformity either in designs of studies or the population or sample considered. There was no randomization of population or samples chosen for various studies.

Lastly, a clear and definite research design could have thrown more light on the true incidence or prevalence figures thus helping the cause rather than creating ambiguity in one's mind.

## REFERENCES

- Abrol, B.M. and Others: Rural survey for E.N.T. and speech and hearing defects at village Chhatera. J. Rehab. Asia., 13(2), 1972, 24-26.
- Abrol, B.M. and Others: Rural survey for speech and hearing defects at village Bijwasan. Silent World, 6, 1971, 11-20.
- Clarke, B.R. & Kendell, D.C.: Communication for hearing handicapped in Canada. In H.J. Oyer (Ed.) Communication for the hearing handicapped. An International Perspective. Univ. Park Press, 1976.
- Gaertig, D.B.: "Communication for hearing handicapped people in Poland". In H.J. Oyer (Ed.) Communication for the hearing handicapped. An International Perspective. Univ. Park Press, 1976.
- Gupta, O.P.: Hearing studies in Varanasi. In Problems and research needs in speech and hearing in India. Proceedings of the second all India workshop on speech and hearing problems in India, Vellore, India, 1967, 74-79.
- Jain, S.N.: Hearing studies in Kakinada. in Problems and research needs in speech and hearing in India, proceedings of the second all India workshop on speech and hearing problems in India, Vellore, India, 1967, 59-64.

- Kameswaran, S.: Hearing studies in Madurai. In Problems and research needs in speech and hearing in India, proceedings of the second all India workshop on speech and hearing problems in India, Vellore, India, 1967, 70-73.
- Kapur, Y.P.: A study of hearing loss in school children in India, J. Speech. Hear. Pis., 30, 1965, 225-233.
- Lowe, A.: Communication for hearing handicapped people in Austria, Federal Republic of Germany and Switzerland. In H.J. Oyer (Ed.) Communication for the Hearing Handicapped. An International Perspective. Univ. Park Press, 1976.
- Lundborg, T.: Communication for hearing handicapped in Sweden. In H.J. Oyer (Ed.) Communication for the Hearing Handicapped. An International Perspective, Univ. Park Press, 1976.
- Manohar, P.D. and Jayaram, M.: Prevalence of speech problems among school children of Mysore City. J. All. Ind. Instit. Speech Hear., 4, 1973, 126-130.
- Munn, Normal, L.: Introduction to Psychology, Oxford AIBH publication, 1971.
- Murphy: Communication for hearing handicapped people in the United Kingdom and Republic of Ireland. In H.J. Oyer (Ed.) Communication for the Hearing Handicapped. An International Perspective, Univ. Park Press, 1976.

Shah, Vijay and Others: Hearing survey of school going children in Bombay City (Preliminary report). Silent World, 6, 1971, 43-47.

Shailaja Nikam: School screening programme in Mysore City. J. All Ind. Instit. Speech Hear, 1, 1970, 28-32.

Tosi, O.: Communication for hearing handicapped in Argentina. In H.J. Oyer (Ed.) Communication for the hearing handicapped. An international perspective. Univ. Park Press, 1976.

Viswanath, M.S. and Others: Naguvanahalli screening: A pilot project. J. All. Ind. Instit. Speech Hear., 2, 1971, 136-139.



**STATUS OF STUDIES OF INCIDENCE OF SPEECH AND HEARING DISORDERS IN INDIA IN BRIEF**

Year	Name of the Investigator	Place	Objectives	Equip. used & Test environment	Type of professional(s) involved	No. of subjects treated	No. of cases with Sp. & Hr. problems	Hearing loss %	Speech defects %
1960	Kapur, Y.P.	Vellore	Audiological assessment	2 Amplivox (82-C) Audiometers	ENT Surgeon and Audiometry technicians	867	-	16.35 to 18.6	Not reported
1966	Bhatia, M.I.	Lucknow	Audiological assessment	Amplivox Audiometers	ENT Surgeon and Audiometry technician	3000	-	Mild: 28 (upto 25 dB) Moderate: 31 (25 dB to 50 dB) Severe: 41 (above 50 dB)	Not reported
1967	Kameswaran, S	Madurai	Audiological assessment	Not mentioned	ENT Surgeon Others not mentioned	1886 221 194	460	3.6 11.7 23.7	Not reported
1967	Jain, S.N.	Kakinada	Audiological assessment	Tuning Forks and Live Voice	ENT Surgeon Others not mentioned	4720	1747	16	0.11
1967	Gupta, O.P.	Varanasi	Audiological assessment	Tuning Forks for screening. Audiometer for check-up	ENT Surgeon and Research Fellow	3604	1367	34	Not reported
1971	Abrol, B.M.	Bharat	Audiological assessment	Arphi cal assess- model MK II	ENT Surgeon, Audiometry technicians, Speech Therapists and Teachers for the Deaf	2300	-	18.9	3.9
1971	Vivekanath, M.S.	Maguvana halli	Screening	Beltone 12-D	Speech Pathologists and Audiologists	410	-	18.9	3.9
1971	Shailaja Nikam	Mysore City	Case finding	Amplivox (83) and Beltone 12-D	Speech Pathologists, Audiologists & ENT Surgeon	2086	82	3.9	-
1971	Vijay Shah	Bombay City	Audiological screening	Not reported	Speech Pathologists and Audiologists	7100	1113	15.6	Not reported
1972	Abrol, B.M.	Chhatara	Audiological assessment as part of a Health Camp	Not reported	ENT Surgeons, Audiometry technicians and Speech Therapists	187	2	1.2	1.2
1973	Manohar and Jayaram	Mysore City	Speech Evaluations	-	Speech Pathologists and student trainees of AIISH	1454	-	-	14.91

\*Test environment acoustically not treated.