Chapter 7

SENSORY AIDS AND OTHER EQUIPMENT

INTRODUCTION

This chapter discusses various types of sensory aids and related equipment currently in use, such as corrective lenses and other optical vision enhancement devices, closed circuit television systems, talking books, large-print and braille reading material, canes, guide dogs, hearing aids, captioned films, and speech training aids.

The chapter also discusses promising devices that either are not yet fully developed or are not yet widely used, intended to aid in reading, writing, mobility, speech training, and speech perception. They include such devices as hearing aids that not only amplify but also modify the frequencies at which aural information is presented, electrocortical prostheses, and devices for converting visual information to tactile or aural information, or for converting aural information to tactile or visual information.

This chapter also briefly describes the population needing sensory aids, presents information on the costs and the effects of current and potential aids, reviews the multitude of government programs concerned with these aids, and presents recommendations for program improvement.

We believe that nearly all hearing and vision handicapped youth need and can benefit from some type of sensory aid. A majority of them, however, do not have the aids they need. For example, the device most often used is the hearing aid, yet only about one-third to one-half of the hearing handicapped youth have hearing aids, and the use of such aids depends strongly on family income. Current annual expenditures on sensory aids for handicapped youth are impossible to determine accurately because they are generally part of a larger budget in one of the many programs concerned with such devices. We can make an estimate, however, by adding known expenditures for aids described later in this chapter and in our companion report, R-1220-HEW; doing so yields a total of at least $40 million a year in public and private expenditures, while the correct figure is probably on the order of $50 million. To provide aids to all youth that need them would cost at least another $50 million annually.

Nearly all types of public agencies serving handicapped youth expend some funds on sensory aids, but no agency has major responsibility for perfecting and disseminating these aids. The federal government engages in a variety of activities connected with aids: it directly provides certain aids, it funds aids through various programs, and it stimulates sensory aid development by research in still other programs. The aids themselves, however, are usually dispensed by private dealers or organizations, and private funds are often used to purchase them.

Several problems afflict current programs concerned with sensory aids. They are numerous, fractionated, and unorganized. Too few youth needing sensory aids have them. If one believes that access to an aid should be a function of the child’s need, not family income, then there are inequities in distribution. Considerable progress has been made in creating new aids, but many of these are not properly tested and guided through the many steps needed to convert a promising prototype device into a rationally designed production model. And mechanisms for assuring that produc-
tion models are widely distributed among the handicapped consumers need much improvement.

Recommendations for improving the quality, quantity, and distribution of sensory aids have been divided into two groups: those that involve the sensory aids directly, and those related to complementary services that can make a sensory aids program more effective or eliminate the need for a sensory aid altogether. Sensory aids were rated as one of the top three most important services by the families we interviewed. Hearing aids and corrective lenses were the aids most often mentioned as being valuable; however, these aids may have been singled out by the families because they are the types most likely to be needed and are also the best-known aids. (Chapter 2 discusses mechanisms and potential government roles for implementing these recommendations.)

IMPROVEMENTS IN SENSORY AID PROGRAMS

- All hearing and vision handicapped youth who can benefit from sensory aids should be assured of having them. The judicious choice of an aid can make the youth functionally less handicapped, lessen his need for other special services such as education in a special classroom, and improve the effectiveness of other services such as education and job training. Most sensory aids appear to be cost-effective and to improve the youth’s quality of life significantly, especially the two types of aids most often needed: corrective lenses and hearing aids. Depending on the type of aid, the youth or his parents may also need to be trained to use and maintain the device.

- Coordinated and intensified effort is needed in support of research and development programs aimed at designing and testing new aids for the handicapped, and to convert promising prototype devices into fully human-engineered production instruments. Some of the new devices currently in the research and development stages show promise of giving the visually handicapped ready access to normal printed material, and of significantly improving their mobility; and they show promise of giving the hearing handicapped significantly improved speech perception capability.

IMPROVEMENTS IN SERVICES COMPLEMENTARY TO SENSORY AIDS

Certain services are ancillary but necessary to the effective provision of sensory aids.

- Many children may not receive needed sensory aids because their handicap is not identified. In Chapter 4 we recommended screening all children for hearing and vision impairment. An early identification program would be particularly helpful to preschool hearing handicapped youth, who should be fitted with hearing aids as early as possible so that language development is facilitated.

- The provision of a direction service, as discussed in Chapter 3, could give parents and teachers needed information on the value of various types of sensory aids available, on which aids are appropriate for the child, and on where to obtain them. This direction service would coordinate the presently fragmented delivery system.

- Since an impairment can often be stabilized, alleviated, or eliminated medically or surgically, a medical specialist should examine the child before sensory aids are dispensed.
AIDS FOR THE FUNCTIONALLY BLIND AND THE PARTIALLY SIGHTED

Among the many sensory aids and other equipment for the visually handicapped are corrective lenses, other optical and electro-optical vision enhancement devices such as binoculars and closed circuit television systems, talking books, tape recorders, large-print and braille reading material, braille writers, canes, guide dogs and other mobility aids, and devices that convert visual information to aural or tactile information (for example, the Optacon reading device and special timepieces).

Over the years, many survey papers on sensory aids and other equipment for the functionally blind and partially sighted have been published. For example, Sloan\textsuperscript{1} has surveyed head-worn, hand-held, and stand-mounted optical magnifiers for the partially sighted, and Nye and Bliss\textsuperscript{2} have surveyed various reading, writing, and mobility aids for the functionally blind and some reading and writing aids for the partially sighted. Proceedings of several conferences on aids for the visually handicapped contain detailed descriptions of various types of aids.\textsuperscript{3} In view of the thoroughness of these and other reports, we did not generate still another detailed listing and description of such devices. Rather, we have chosen to review the various types of sensory aids and other equipment that improve or show promise of improving the educational and vocational prospects, as well as the overall quality of life, of the visually handicapped population.

Recall that this report considers a person visually handicapped if the visual acuity in his better eye with corrective lenses is no better than 20/70, or if the visual field is so restricted that he cannot maneuver safely in an unfamiliar environment without the assistance of a guide dog, cane, or sighted person. An acuity that is no better than 20/70 with correction lies in the approximate range in which a person is unable to read ordinary newsprint. Of the approximately 193,000 visually handicapped youth aged 0 to 21 in the United States, only about 7 percent have either no sight or so little sight that they must be regarded as functionally blind rather than functionally partially sighted.\textsuperscript{4} Further, only about 30 percent of the legally blind need to be functionally blind. By functionally blind we mean the person is: visually handicapped; unable, with or without the aid of an optical or image enhancement device, to use his eyes to read printed or handwritten material as the literate sighted do or to recognize familiar objects as the illiterate sighted do; and unable to maneuver safely in an unfamiliar environment without the assistance of a guide dog, a cane, or a sighted person. As Genensky has pointed out, the problems of the partially sighted are distinctly different from those of the functionally blind, and, further, these two subsets of the visually handicapped population, in general, need distinctly different sets of services and sensory aids.\textsuperscript{5} However, nearly all of the


\textsuperscript{5} S. M. Genensky, \textit{A Functional Classification System of the Visually Impaired to Replace the Legal Definition of Blindness}, The Rand Corporation, RM-6246-RC, April 1970. See also L. H. Goldish, "The
visually handicapped need some type of aid when reading and writing, and all of the functionally blind and a majority of the partially sighted need some type of mobility aid.

Corrective Lenses

The most important type of sensory aid needed by the great majority of the partially sighted is corrective lenses. We were unable to locate reliable data on how many handicapped youth possess them, but it is very clear that these lenses significantly upgrade the quality of life of the partially sighted, and should improve their ability to benefit from other services such as education. At a typical cost of perhaps $150, with replacement every three years, starting at age 2, and using an 8 percent discount rate, we calculate that lifetime average earnings would have to be increased by at least 12 cents per hour to offset the cost. If a more expensive type of optical aid were needed, costing perhaps $300 and lasting 10 years, then the average earnings would have to increase at least 10 cents per hour to offset costs.

Reading and Writing Aids

For about 150 years, braille or other embossed writing has been used for reading and writing by some of the legally blind population. At no time, however, has a majority of that population used braille—even today the figure is perhaps less than 10 percent. This is due to many factors, including the complexity of the braille code, the relatively low reading speeds usually attained, the large and awkward size of braille volumes, the limited braille literature, and a perceived stigma associated with its use by many of the newly functionally blind. Reading speeds of up to 200 words per minute have been recorded for rapid braille readers, but the average range is 60 to 120 words per minute. However, since most legally blind people can or could visually read ordinary or enlarged printed material with the aid of appropriate optical or image enhancement devices, a primary dependence on braille is not necessary.

People who can be functionally partially sighted should not be summarily channeled into the use of braille. The fact that they often are is due to the crude and regrettable dichotomization of the population into the sighted and the legally blind. Some partially sighted people are channeled not only into braille for reading and writing, but into mobility training with the long cane or guide dog, and hence are conditioned to act, think, and feel as if they were functionally blind. This can put severe and unnecessary restrictions on their educational and vocational opportunities.

Among the functionally blind, there has been a tendency in recent years to use taped material to supplement and sometimes replace braille, perhaps because taping can be faster than embossing braille, and is a relatively compact way to store information. Tapes have at least one serious drawback: the problem of gaining rapid access to specific items at various locations along their length.


Corrective lenses typically cost $100 to $200 including professional fees. Low-vision aids range in cost from a few dollars for a simple magnifier, to $1000 to $1300 for a CCTV system, to $3500 for an electro-optical to tactile reading device. Special low-vision spectacles typically cost $150 to $500.

If a 4 percent discount rate were used, the foregoing figures would be approximately 6-1/2 and 4-1/2 cents per hour, respectively.

Talking books in the form of tapes or records are also used by about 18 percent of the legally blind, and about 75,000 people read large-print books.\(^9\)

Attempts have been made to speed up the rate and ease with which printed material can be converted into braille. Nye and Bliss\(^10\) describe some of the work that has gone on to achieve these goals.

Historically, most of the research and development expenditures on devices to assist the visually handicapped have been spent on projects concerned almost exclusively with the needs of the functionally blind. A 1971 National Academy of Sciences Report\(^11\) indicates that at least $1,383,000 was spent in 1970 by the Social and Rehabilitation Service, Veterans Administration, Office of Education, and the National Eye Institute on research and development concerned with such devices. Analyses of the constituent data suggest that over 90 percent of that sum was spent on projects aimed at helping less than 8 percent of the visually handicapped population, namely, the functionally blind. Even if we exclude the partially sighted who are not legally blind, our calculations indicate that more than 90 percent of the research and development dollars went to help less than 31 percent of the legally blind (i.e., the functionally blind), and hence less than 10 percent of those dollars went to help the more than 69 percent of the legally blind who are partially sighted. The research and development projects reported included those assisting the partially sighted to read printed material with their residual vision, and assisting the functionally blind to cope with printed material using one of their nonvisual senses, to read braille, and to get around with a cane or other sensing devices. The projects also include those aimed at developing methods for preparing special material for use by the functionally blind. Medical projects aimed at treating or understanding ocular pathologies are not included—such projects do not involve the design, fabrication, testing, or evaluation of a device or process aimed at helping the visually impaired to cope with their education, vocation, or the general environment. It should also be noted that the National Academy of Sciences project compilation is said to be incomplete. Even so, it is hard to believe that the heavy bias of research and development dollars and projects toward the functionally blind is due primarily to incomplete reporting.

In the past three years, the Social and Rehabilitation Service (SRS) and the Veterans Administration have made efforts to change the balance of emphasis and funding just described. For example, the SRS lent support to the research that led to The Rand Corporation’s development of closed circuit TV (CCTV) systems that help the partially sighted to use their eyes to read printed and handwritten material, to write with a pen or pencil, and to carry on other operations that require precise eye-hand coordination.\(^12\) The key to the systems’ value is that magnification can be combined with increased contrast and with contrast reversal.

Some 1500 CCTV systems have been sold to date, and over 40 per month are currently being produced. They sell for under $1500 per unit. They are being used in schools, in libraries, on the job, and in the home. The Veterans Administration and the California Department of Vocational Rehabilitation, among others, now make CCTV systems available to partially sighted clients for use in school and on the job. Reading rates of 80 to 120 words per minute are typical, and some users

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\(^9\) National Academy of Sciences, op. cit.
\(^11\) National Academy of Sciences, op. cit.
\(^12\) S. M. Genensky, H. E. Petersen, H. L. Moshin, R. W. Clewett, and R. I. Yoshimura, Advances in Closed Circuit TV Systems for the Partially Sighted, The Rand Corporation, R-1040-HEW/RC, April 1972. Neither Rand nor any of its staff engaged in research on CCTV systems for the partially sighted have any interest in any company that manufactures, distributes, or sells such systems.
reach 200 words per minute. These are approximately the same rates as are achieved with braille, but with CCTV’s all printed or written material can be read, not just specially prepared (braille) material, and any item that will fit under the camera can be examined visually—a slide rule, for instance.

The development of CCTV aids illustrates that human engineering of devices is very important. The most successful CCTV systems are quite simple and easy to operate, and have rational designs. Roughly speaking, a CCTV system for the partially sighted consists of a TV camera, a zoom lens, a TV monitor with some added electronics, a bright light, and a moveable platform on which the item to be viewed is placed. Merely putting such parts together is not enough to produce a good CCTV system, however, and several inadequate systems have come and gone. One must carefully choose the component parts, make design modifications in either the camera or monitor or both, and configure the instrument so that the viewer can use it with ease while seated in a natural and comfortable position.

A CCTV system has certain advantages over other reading aids for the partially sighted. For example, (1) it does not require the generation of special reading material, such as large-print books, because it can present magnified images of various sizes on its TV monitor, and (2) the images can be brighter and of higher contrast than is possible with any pure optical device. It can also present an image with the contrast reversed—for example, black type on a white background can be presented as white type on a black background; and it can view low-contrast material, such as most newspaper type, and display it as high-contrast white letters on a black background or black letters on a white background. These features, too, are beyond the capability of a purely optical aid. The result is that with the aid of contrast reversal and other image enhancement techniques, many partially sighted people are able to read print with their eyes, and write with a pen or pencil, who could not handle those tasks using other types of devices.  

Mehr, Frost, and Apple made a careful comparison of optical aids and CCTV systems with the help and cooperation of 40 partially sighted veterans. They found that these veterans’ reading rates were higher and reading durations were much longer with a CCTV system than with an optical aid. The veterans were also able to write much more clearly and neatly with a CCTV system. All the subjects could do this with the help of a CCTV system, but only 63 percent of them could do it with the help of an optical aid.

Among the many devices that have been explored or developed for use by the functionally blind, one of the most promising is the Optacon, which was designed by Bliss and his colleagues at Stanford University and the Stanford Research Institute, and which is now manufactured by Telesensory Systems, Inc., of Palo Alto, California. This electro-optical to tactile reading aid permits the functionally blind to read ordinary printed material, letter by letter, by moving a probe over the material with one hand and with the other hand sensing a tactile image of each letter being viewed by the probe. The probe contains an array of sensing diodes, and the trough in which the sensing index finger is placed contains a tactile sensing element corresponding to each of these diodes. When the probe views a symbol, for example, a “B”, the only tactile elements that stimulate the sensing finger are those that correspond to diodes that are viewing the printed “B”. According to Telesensory Systems, Inc., 200 Optacons are currently in use, and as of December 1972, the

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13 Genensky et al., op. cit.

company estimated that new orders are coming in at the rate of about 35 per month. Optacon sells for about $3500 per unit. Telesensory Systems advertises that people read with the device at rates as high as 80 words per minute, and one official of the Veterans Administration indicated that rates of perhaps 40 to 50 words per minute were typical in his limited experience.\(^{15}\)

At first glance, being able to read ordinary printed material at the rate of 50 words per minute does not sound very impressive. It sounds much more so, however, when we consider that after the development of Optacon and other electro-optical to tactile or electro-optical to auditory devices, it was possible for the functionally blind person to read printed material himself rather than having a sighted person read to him. To anyone who is functionally blind (or even partially sighted), being able to read even at a very low speed means less dependence upon others and more privacy and personal satisfaction. For example, a rate of 50 words per minute allows the functionally blind to read their own mail and short magazine articles. Even so, it must be recognized that such a slow rate is not conducive to reading full-length books. Consequently, Optacon and other similar devices, as currently configured, should not be looked upon as a replacement for sighted readers or for all materials in braille or on tapes or records. They should, however, be looked upon as useful supplements to the more traditional techniques for enabling the functionally blind to read.

Mach Laboratories of Dayton, Ohio, with financial support from the Veterans Administration since at least 1957, has carried on research aimed at helping the functionally blind to read ordinary printed material. We have been told by Mach Laboratories that they now have an electro-optical to auditory reading aid for the functionally blind that they intend to offer for sale. This device, the Stereotoner, uses an electro-optical probe consisting of a vertical line of sensors that is moved across the printed line by the user. The Stereotoner transmits musical tones to the user's ears. The higher and louder sounds appear to come from the user's right, and the lower and softer sounds from his left. The high notes are induced by the tops of letters like "h", "k", and "t", and the lower notes by the bottoms of letters like "g", "p", and "q". Mach Laboratories is making 85 Stereotoners. The Veterans Administration is purchasing 50 for about $1875 each, 15 will be turned over to the National Academy of Sciences for evaluation, and 20 are for sale to any organization or person who might want them.

Work is going on at various rates at Mach Laboratories, MIT, and Haskins Laboratories on devices that scan printed material electro-optically and produce either an audible letter-by-letter spelling of words (called spelled speech) or an actual word-by-word audible rendition.

For example, Haskins Laboratories has been experimenting with a device that scans the printed word letter by letter, determines whether it has the combination and permutation of letters in its memory unit and, if it does, produces an audible rendition of the word. If it does not, it produces an audible spelling of the word.

Mach Laboratories is working on a device called the Cognodictor, which is said to be capable of recognizing both capital and lowercase letters, but not punctuation marks, numbers, and other special symbols. It produces an audible rendition of those letters, and it has some buffering capability, which permits the spelled speech to sound less mechanical—for example, "T-H-E M-A-N I-S T-A-L-L" is rendered more like "THE MAN IS TALL." The device is said to have a 2- to 3-percent error rate; and it requires that the user keep the electro-optical probe on the line, that he adjust it for differences in letter size, and that he be able to recognize the tactile image

\(^{15}\) Interview with R. Bennett, Veterans Administration Hospital, Palo Alto, Calif., November 1972.
revealed to four fingertips on the hand he uses to move the probe across the printed line, when and if the Cognodictor cannot recognize a printed symbol. Mach Laboratories states that the Cognodictor, which currently is said to need modification, permits reading rates of 80 or 90 words per minute.

As Nye and Bliss\(^{18}\) point out, the devices under design at Haskins Laboratories and at MIT, which are meant to produce speech that is adequately recognizable and appealing to the ear, will probably be expensive and far beyond the reach of the individual functionally blind user if they ever reach the production stage. They might be purchased by large libraries and other facilities, however, that serve many functionally blind people.

A subject of recent research interest and funding by the National Institutes of Health is electrocortical visual prosthesis, the stimulation of visual sensations by means of electrodes implanted in the brain. While it is possible to create arrays of visual sensations in this way, this type of prosthesis is still at an embryonic stage and it is unlikely to be of practical use to the blind in the near future.

**Mobility Aids**

A 1963-1964 National Health Survey\(^{17}\) found that 36 percent of persons who could not read newsprint used an aid such as a cane, guide dog, or other person for mobility; and a 1971 report by the National Academy of Sciences estimated that more than 50 percent of the legally blind have canes.\(^{18}\) According to Nye, however, only about 15 to 20 percent of the legally blind have had cane-travel training—that is, instruction in the efficient and effective use of a cane.\(^{19}\) Some of the visually impaired use a cane as no more than a signal to motorists and pedestrians.

The American Foundation for the Blind lists about ten organizations that raise or train guide dogs and teach functionally blind people how to use them, but only about one percent of the legally blind do so. Many people who serve the functionally blind, and some of the blind themselves, look upon these helpful creatures with disfavor, often because they believe that dependence on a dog prevents a functionally blind person from achieving genuinely independent mobility. They feel that he has a better kinesthetic grasp of the environment while using a cane, and that it forces him to handle travel problems more realistically. They may admire and love dogs, but they nevertheless look upon them as potential obstacles to a functionally blind person’s obtaining a job, and they may argue heatedly that guide dogs must be walked, fed, and otherwise cared for, and hence prolong or interfere with their masters’ day.

The most acceptable mobility aid to date for the functionally blind appears to be the long cane specially designed by R. E. Hoover. This simple device permits a functionally blind person to detect obstacles on or near the ground several feet in front of him, and thus gives him time to take evasive action. It does not warn him of overhanging obstacles such as scaffolding or casement windows, however, and it can fail to warn him of depressions quickly enough and of objects that might endanger his upper body. Several techniques have been tried to reduce those dangers, but


\(^{19}\) Op. cit.

none have yet gained wide acceptance. The most promising may be the laser cane developed by Haverford College and Bionics Instruments, Inc. It is composed of the Hoover cane and three lasers, each of which scans a region of interest to the traveler: head level, mid-section, and ground level. The laser cane also has a ranging capability that indicates to the traveler roughly how far he is from a potential hazard. All three lasers trigger a single tactile warning device that presses against one of the traveler’s index fingers. Two of the lasers also give him auditory warning: the head-level laser activates circuitry that produces a high-pitched sound, and the ground-level laser generates a low-pitched sound. About 18 laser canes are now in use or on order by the Veterans Administration.

The ultrasonic spectacles developed by L. Kay also appear to be of interest in conjunction with the Hoover cane. They emit an ultrasonic signal which, when reflected back from an obstacle, produces an audible binaural signal and gives the traveler some indication of the direction of and distance to the obstacle.

A less sophisticated device that also may become a useful supplement to the Hoover cane is the Travel Pathsounder, developed by Russell and the MIT Sensory Aids Evaluation and Development Center. Worn on the chest, this device detects obstructions up to six feet in front of the traveler. When it does so it emits a ticking sound that grows more rapid as the traveler gets closer to the obstacle. When he is within 30 inches of it, the ticking sound gives way to an urgent beeping.

While most partially sighted people do not or should not need to use a cane or other guidance device, they nonetheless may need some guidance instruction. By learning to use the visual cues that remain within their capability, they can do things that the normally sighted would regard as virtually impossible at first glance.

Simple and effective techniques can often be used. For example, glare frequently prevents partially sighted people from seeing whether a traffic light is red or green straight in front of them when they want to cross a street. But oftentimes they can look off at a right angle and see when the traffic light turns yellow and red for crosswise traffic. Coupling that knowledge with the sounds and sight of traffic movement, they can deduce when they have the green light with them. A skeptic may admit this is ingenious but doubt that the partially sighted could also detect oncoming cars. The answer is that most of these people can hear vehicles coming and can see what Genensky calls “the essence” or “gestalt” of the car soon enough to take precautions. After all, a pedestrian does not need to know the make and year of an oncoming car to tell whether it is a hazard.

Genensky has also described the value of binoculars as a reading, writing, and mobility aid.20 They permit many partially sighted people to do such things as read the number and route name on the front of a bus, read street signs, view traffic signals and “walk-don’t walk” signs, read street numbers and names of stores, and view merchandise in a store or in its show windows.

Another electro-optical to tactile aid that may prove useful to the functionally blind for mobility and other purposes has been researched by P. Bach-y-Rita.21 This device, called a tactile television system, converts information gathered by a TV camera into a coarse tactile image on a person’s back or stomach by means of an array of vibrating electromechanical stimulators. This allows recognition of some

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objects. Starkiewicz and Kuprianowicz\textsuperscript{22} have stimulated the skin of the forehead in an attempt to achieve similar results.

**AIDS FOR THE DEAF AND HARD OF HEARING**

Sensory aids for the hearing handicapped include hearing aids, captioned films and TV, speech training and speech perception aids that convert aural information to visual or tactile, and devices to aid activities of daily living, such as "doorbells" that flash lights and a teletype-like device for use with a telephone.

Recall that in this report we consider persons aurally handicapped if they have frequent difficulty understanding normal speech, or worse. In terms of average decibels of hearing loss in the better ear in the 500 to 2000 Hz range, that is considered to be about 40 dB or more (ISO). A summary discussion of definitions and prevalence data is contained in our companion Rand report, R-1220-HEW. A more detailed survey-document in this field has been published by the National Institute of Neurological Diseases and Stroke;\textsuperscript{23} it notes problems with both definitions and prevalence data, but suggests that the most widely accepted definition of a deaf person is one "in whom the sense of hearing is nonfunctional for the ordinary purposes of life." In average decibels of loss in the better ear, that level is approximately in the range from 85 to 90 dB and up. Our review of prevalence data (in R-1220-HEW) suggests that approximately 50,000 U.S. youth aged 0 to 21 years can be considered deaf, and another 440,000 youth are aurally handicapped but not deaf. One new source of prevalence data is a national speech and hearing survey of a random sample of 38,884 public school subjects in the United States, which has not yet been fully reported.\textsuperscript{24} Preliminary analysis of data from that survey,\textsuperscript{25} which excluded students in special schools or special classes, indicates that our estimate of 490,000 hearing handicapped youth aged 0 to 21 with loss greater than 40 dB may be a little low. Consequently, our estimates of need for sensory aids may be low.

Nearly all of the 440,000 partially hearing youth—those who are aurally handicapped but not deaf—need hearing aids.\textsuperscript{26} A small fraction of the hard of hearing may not be able to benefit from hearing aids, for example, those with dysacusis disturbances primarily characterized by garbled hearing. The approximately 50,000 deaf youth have distinctly different needs for aids since their sense of hearing is essentially nonfunctional. There are two different classes of deafness: congenitally deaf youth have an impairment that occurred before language and speech were acquired; adventitiously deaf youth have a sense of hearing that became nonfunctional through illness or accident, generally after language acquisition. Speech perception aids are desirable for both types of deaf youth. Speech training aids are most desirable for the congenitally deaf, but can also be useful in helping adventitiously deaf youth to maintain a reasonably high quality of speech. However, while

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\textsuperscript{22} W. Starkiewicz et al., "60-Channel Electrophthalmay with Cd S0\textsubscript{2} Photoresistors and Forehead Tactile Elements," in ibid., pp. 295-300.


\textsuperscript{25} F. M. Hull and J. A. Willeford, National Speech and Hearing Survey Progress Report, Part II, Colorado State University, Fort Collins, Colorado, May 9, 1972.

\textsuperscript{26} H. Davis and S. R. Silverman (eds.), Hearing and Deafness, 3d ed., Holt, Rinehart, and Winston, New York, 1970, for example, cite a hearing level of 40 dB or worse in the better ear as the range in which a hearing aid generally is needed.
high-quality hearing aids are available, much remains to be accomplished in the development of speech training and speech perception devices.

The degree of unaided and uncorrected hearing loss, like the degree of unaided vision loss, is not a good measure of the degree of permanent sensorial handicap, because it does not take into account how well the hearing impaired person can function with an aid or after medical or surgical correction. For example, a hearing impaired person can have a very severe unaided and uncorrected hearing loss due to a malfunction or degeneration of the eardrum or one or more of the small bones in the middle ear, but surgical intervention may enable him to hear so well that he has no need for a hearing aid and has little or no difficulty with normal speech. A youth’s need for a sensory aid therefore should not be established until he has received an otologic examination by a qualified physician.

Hearing Aids

A hearing aid is basically a microphone to pick up sound, an electronic device to amplify and perhaps modify the sound in other ways, and an earphone. The many models available differ from one another in various ways, such as aesthetically, in the amount of sound amplification, in the relative amplification of different frequencies of sound, and in their ways of controlling very loud sounds. Some aids modify the frequencies of sound to give the person more information in the frequency range within which he can hear best. An earmold provides a tube to convey sound from the earphone to the eardrum. Historically, hearing aids made a tremendous leap forward in utility with the advent of small transistorized versions in the early 1950s.

If the inner ear and the auditory nerve or the auditory cortex in the brain are insensitive, a hearing aid may be useless; but if the problem is a lack of conduction of sound to the inner ear, a hearing aid normally yields beneficial results. Again, an otologic examination by a qualified physician may suggest a medical or surgical method of alleviating the hearing loss, and should be conducted before a hearing aid is dispensed to a child. After a hearing aid is selected, the youth or his family need information on its use, care, and maintenance as with other types of aids, and the family may need advice on how to motivate the child to use the aid.

Hearing aids for young children can be a problem because the instruments need to be physically robust, it is difficult to obtain good impressions of small ears for earmolds, and rapid ear growth makes it difficult to maintain good earmold fit—but early fitting is especially important to facilitate language development.27

For further summary information on hearing aids, the reader can refer to several recent publications.28

In addition to personal hearing aids, group hearing aids exist. I. J. Hirsh describes the development of group aids and how they have been used in teaching persons with very serious hearing losses. One of the most successful has been the induction loop transmitter. It consists of one or more loops of wire that encompass

a classroom and are connected to one or more microphones, which are used by the teacher and the students to communicate with one another. Each student wears a special hearing aid, which is equipped with an induction coil that picks up signals from the room-encompassing loop. This arrangement permits the students to move around the room freely and still listen in to the discussion.

Frequently, persons with severe hearing impairment are able, albeit unevenly, to hear sounds at frequencies below 1000 Hz and down to about 125 Hz with their residual hearing. At least two types of experimental instruments have been developed that try to take advantage of this residual capability. One is called a low-frequency, extended-range amplification system. It delivers amplified signals down to about 80 or 100 Hz. The hope is that extending the range of a hearing aid down to those frequencies, rather than settling for the conventional cut-off at 300 to 400 Hz, may give the listener auditory clues with respect to a male voice, and thus enhance the listener's chances of understanding what that voice is saying.

Another type of instrument modifies the energy distribution of the sound across frequencies and delivers more of that energy at frequencies at which the person's hearing is best. For example, the energy in the entire range of speech-sound frequencies may be shifted into a compressed lower-frequency range, or only the higher sound frequencies may be filtered out and the information transposed and presented at lower frequencies. Erber has reviewed a number of experiments carried out to test the value of these techniques in the communication training of the hearing handicapped. He found no conclusive evidence that either technique was or was not of significant value.

Aids to hearing by means of electrocortical aural prosthesis are roughly at the same stage of development as electrocortical visual prosthesis, namely, the feasibility study stage. Research on implants in the brain is interesting and may someday result in useful sensory aids, but is unlikely to do so in the near future.

In 1962, of the binaurally hearing impaired population in the United States who could hear and understand a few spoken words without an aid, about 29 percent of those of all ages, and 31 percent of those under age 45, used hearing aids. The usage rate among families with annual incomes over $7000 was about twice that for families with incomes under $2000 per year. Of persons who could not hear and understand spoken words without an aid, 43 percent of those of all ages, and 40 percent of those under age 45, used a hearing aid. The basis for selecting the aid was a doctor's or clinic's prescription in about one-third of the cases; hearing aid dealers' advice accounted for another third; and the remainder based their selections on advertising, the recommendation of a layman, or on a reason unknown to us. Of persons who had ever used an aid, 68 percent of those who cannot hear and understand spoken words without an aid, and 61 percent of those who can hear and understand a few spoken words without an aid, reported they were very satisfied or fairly satisfied with the aid. While we could locate no reliable data on the use of hearing aids by children, the relatively low usage rate for persons of all ages suggests that only a fraction of the children that could benefit from a hearing aid presently have one. That fraction is probably less than one-half and may be as low as one-third.

It is clear that by improving hearing ability, these aids can significantly improve the quality of life of these handicapped youth, and also improve their ability to benefit from education and to succeed vocationally. Hearing aids generally range in

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price from approximately $100 up to $700, with a high-quality aid typically costing $300 to $350. Using a typical cost of $350 and assuming annual operating expenses of $60, with replacement every two years for children ages 2 to 10 and every five years thereafter, and using an 8 percent discount rate, we calculate that lifetime average earnings from ages 18 to 55 would have to be increased by at least 39 cents per hour to offset the cost. At an assumed discount rate of 4 percent, the breakeven point in earnings is 19 cents per hour.

We are obliged to rely on analyses of the "breakeven point" type since no data exist on the change in economic benefits due to use of a sensory aid. Note that for simplicity we have described the breakeven point in terms of earnings alone, but other benefits may also accrue, notably a reduction in the cost of providing various services to the handicapped person. Thus, the actual earnings increase needed to offset the cost of the aid would be, say, 19 cents less some amount to account for the decrease in cost of providing other services later in the child's life. The largest cost reduction can be in education, if the aid so improves the child's hearing that he no longer requires expensive special education services. Ling reports that "owing to the use of hearing aids, a large proportion of children who formerly received their education in special schools have been able to compete and conform with their normally hearing peers in regular classes. Many severely hearing impaired children who would formerly have been trained as deaf are now correctly treated as hard of hearing."

While the typical cost of $300 to $350 for a hearing aid seems low in view of the benefits, this is by no means a negligible sum for the poor and often may be prohibitive. Recall the strong correlation between level of income and hearing aid use.

Directions for research to further improve hearing aids are outlined in a recent National Academy of Sciences report, which also makes recommendations on early screening and diagnosis, methods of stimulating language development, and the distribution of existing aids and services.

In 1968, about 400,000 hearing aids were sold in the United States. A comparison of the rate of sales per 1000 population in various areas of the world reveals that the United States and Canada have relatively high usage.

1968 Sales per 1000 Population

<table>
<thead>
<tr>
<th>Region</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States and Canada</td>
<td>2.05</td>
</tr>
<tr>
<td>Western Europe</td>
<td>1.06</td>
</tr>
<tr>
<td>Eastern Europe and Russia</td>
<td>0.40</td>
</tr>
<tr>
<td>Middle and Near East</td>
<td>0.04</td>
</tr>
<tr>
<td>Far East and Oceania</td>
<td>0.14</td>
</tr>
<tr>
<td>Africa</td>
<td>0.02</td>
</tr>
<tr>
<td>Latin America</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Source: Berger, op. cit.

A later report by O. Bentzen and J. Courtois presented data suggesting that the number of patients with hearing aids per 100,000 inhabitants was strongly dependent on government programs, as is shown below, where we cite the two countries with highest usage rates, and the two countries with the lowest usage rates, by three categories of programs.

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Speech Training and Speech Perception Aids

Several surveys of aids to help the deaf learn to speak and other aids to help them understand human speech have appeared in the recent literature. Some of the instruments they describe convert auditory information into tactile signals, such as the Vocoder built at the Speech Transmission Laboratory in Stockholm. If speech sounds are converted to tactile stimuli, for example, the deaf person receives tactile clues to what another person is saying to supplement information obtained by lipreading, and he also receives tactile feedback to help him maintain the quality of his own speech. Other instruments convert auditory information into visual signals, such as the visible speech translator (VST) built at the Bell Telephone Laboratories, and the LUCIA, built at the Speech Transmission Laboratory. If speech sounds are converted to visible displays, for example, the deaf person can be shown and trained to know what certain sounds "look like" and hence to recognize them when spoken by another person; or the displays can show him whether his own speech "looks" as it should to be understandable. These visible displays can be relatively simple, such as light bulbs that are turned on by a certain tone of sound and whose brightness depends on the volume of the sound, or they can be a relatively complex electronic device that analyzes the frequency components of the sound, displays the results as a pattern on a TV-type screen for an indefinite period of time so they can be studied, and stores the video display for future reference. Advocates of audio-to-tactile speech perception and training aids for the deaf argue that the perception of time patterns and rhythms through the skin appears to resemble that encountered in hearing. Supporters of audio-to-visual speech training aids argue that visual models of desired speech patterns can be shown to a student, the student can then practice and have the results stored, and then both the student's and the

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desired patterns can be analyzed and compared in detail by teacher and student. Pickett appears to have reservations concerning the value of audio-to-tactile aids, because the skin has a limited capacity for frequency analysis compared with the ear or the eye.

H. Upton of Bell Helicopter Company has developed another auditory-to-visual aid aimed at helping a profoundly deaf or even a severely hard of hearing person to supplement information obtained about other persons' speech by lipreading and the use of a hearing aid. The aid consists of a set of tiny light bulbs mounted on eyeglass frames; different bulbs flash on and off in response to different sounds in speech.  

Levitt suggests that speech perception aids are as yet only of marginal assistance, but he concludes that speech training aids have already met with a "moderate degree of success."  

In sum, speech training and speech perception aids hold considerable promise, but are not yet in widespread use because they have not been fully developed and methods of using them have not been fully evaluated and disseminated.

A different class of speech perception aid includes captioned films and captioned television. The technology has been developed to provide captions for network television programs, but make the captions visible only to viewers who have specially modified TV sets. The modification reportedly costs less than $100.

In the previous discussion of sensory aids for the visually handicapped, we cited a National Academy of Sciences Report that estimated research and development expenditures of at least $1,383,000, or $1.08 per patient, for the blind and partially sighted in FY 1970. The corresponding figures for the hearing handicapped were only $702,000, or $0.41 per patient. In view of the state of the art of sensory aids we have described, and the sizes and needs of the two populations, it appears that more emphasis than exists presently on sensory aids for the hearing handicapped would be justified, as well as increases, in general, of expenditures for research on aids for both the hearing and the vision handicapped populations.

AIDS FOR THE DEAF-BLIND

There has been a recent growth of interest in what modern technology can do to help the deaf-blind. At the outset, technologists embarking on work in this area must be aware that only a minority of deaf-blind people have no usable residual hearing and no usable residual vision. Most have some residual capability with one or both senses. We in no way wish to imply that technologists should devote their efforts exclusively to that majority; but we believe it would be mistaken zeal to stake everything on finding devices or techniques for the most severely handicapped segment of the deaf-blind population.

Many of the aids developed for persons with either impaired hearing or impaired vision are adaptable to serve many of the deaf-blind, and we need not repeat our discussion of those aids here. In addition, the visual-to-tactile and aural-to-tactile conversion devices we discussed earlier, if developed and adapted, could prove valuable to profoundly deaf-blind youth.

36 Pickett, "Status of Speech Analyzing Communication Aids."
CURRENT SENSORY AID PROGRAMS

Nearly all types of public agencies serving handicapped youth expend some funds on sensory aids, but no agency has major responsibility for perfecting and disseminating these aids. Some school systems purchase classroom sensory aids, and sometimes even personal aids. HEW's Media Services and Captioned Films Program develops and supplies sensory aid materials. The Vocational Rehabilitation agencies purchase hearing aids, corrective lenses, and other reading, writing, and mobility aids for the visually handicapped. Under the Medicaid and the Crippled Children's Service programs, states can purchase sensory aids. Welfare funds also sometimes are used for this purpose. The Library of Congress supplies talking books and braille materials through a system of regional libraries in every state.

Our companion Rand Report R-1220-HEW describes federal programs for developing, disseminating, and purchasing sensory aids. Federal agencies involved include the Bureau of Education for the Handicapped, the Library of Congress, the Veterans Administration, the Rehabilitation Services Administration, the Assistance Payment Administration, the Medical Services Administration, the Maternal and Child Health Service, the National Institutes of Health, the American Printing House for the Blind, the National Academy of Engineering, the National Academy of Science, the National Science Foundation, and the National Bureau of Standards.

The current federal role in the provision of sensory aids is heterogeneous; in some programs the federal government provides the aids directly, in other programs it provides funds for aids that are secondary to the other primary services being funded, and research is funded in many different programs.

The current system for providing sensory aids is unorganized and fractionated, with duplication in some cases, but without any mechanism for insuring that children who need sensory aids receive them. The funding of sensory aids is partially governmental, through a multitude of programs, and partially private. The actual dispensing of the two commonest types of aids, corrective lenses and hearing aids, is typically private but with governmental regulation in many states.

For example, in 1971 about 25 states licensed and regulated hearing aid dealers, 40 and other states have passed regulatory legislation since then. Some form of minimum training for dealers is generally required for licensing, and a few states specifically prohibit selling a hearing aid to a child who has not had an examination by an otolaryngologist or a written recommendation to have such an examination. A recent project sponsored by Ralph Nader describes the present hearing aid service system in detail, strongly criticizes it, and makes several recommendations for improvement, including stronger regulation of the industry. 41

The mechanisms used to provide sensory aids in some other countries are distinctly different from those in the United States. K. W. Berger 42 has reviewed foreign mechanisms for providing hearing aids; the following are some of his findings. In Australia a scheme was introduced in 1968 whereby qualified recipients might rent an aid from the government for about $10 a year. Belgium has a governmental program wherein the hearing impaired person gets a prescription for a hearing aid and then obtains a grant, which is renewed every five years, to purchase a hearing aid, with the amount of the grant based on the type of hearing loss. Since

1951, Denmark has furnished free hearing aids, with free replacements every five years. All hearing aids sold under Norway's health plan must be approved by a central state testing authority, and personalized hearing aids are furnished free to children under 20 years of age and parents with children under 20. Other Norwegians needing aids are given grants toward their purchase. In Sweden, children under 16 are supplied with personalized hearing aids free of charge, while for others a grant is available every 8 years toward the purchase of a hearing aid. In Switzerland, starting in 1959, the federal health insurance program has furnished free personalized hearing aids to hearing impaired persons under 65.
Chapter 8

EDUCATION

INTRODUCTION

This chapter discusses education programs for hearing and vision handicapped youth. It briefly summarizes the population needing special education assistance; reviews federal, state, and local programs providing that assistance; examines the scanty data available on the costs, economic benefits, quality-of-life effects, and equity of service distribution in these programs; and presents recommendations for improvement.

We estimate that about 379,000 hearing handicapped and 123,000 visually handicapped youth need some special assistance in obtaining an education, ranging from the provision of sensory aids only to education in a residential institution. Basically, these are youth who cannot read normal newsprint even with corrective lenses, or who have frequent difficulty understanding normal speech. At present, only about 83,000 hearing handicapped and 28,000 vision handicapped youth are served by special education programs. The structure of the education program emphasizes service to the more severely handicapped—the totally blind and the profoundly deaf. The public schools are the primary agency for delivering service, and the education program for hearing and vision handicapped youth is directed predominantly at youth aged 5 to 17 years. Current state and local expenditures for special education are $146 million annually for hearing handicapped and $66 million for vision handicapped youth. The corresponding federal expenditures are $57 million and $20 million.

The federal government’s role in the education of hearing and vision impaired children is somewhat different from its role in the overall education program for the handicapped. In the overall program, the largest percentage of federal funds is used to stimulate state and local effort. In the education of hearing and vision impaired youth, the role appears to be more one of direct service or basic service support. The federal schools for the deaf, and Deaf-Blind Centers, are examples of heavy federal involvement in the provision of service. The P.L. 89-313 program is an example of basic service support for state-operated or state-supported schools. This different role is relatively more expensive for the federal government; while the federal government provides only 12 percent of the funds we specifically identified for all special education, it provides some 27 percent of the identified special education funds for the hearing and vision impaired. (These percentages are for special education expenditures only. If the unknown amount of regular education expenditures going to the handicapped and the unknown amount of residential mental facility expenditures going for special education were included, the federal percentage would be lowered.)

In this chapter we also attempt to put the current programs in perspective by discussing some apparent problems in the delivery of education to handicapped children: inequitable distribution of service, insufficient resources, lack of information, and gaps in service. The three most significant gaps appear to be the lack of preschool education—especially for the hearing impaired, who need early assistance in developing language and communication skills—the lack of identification of these youth, and the inadequate provision of sensory aids.
Recommendations for improving the quality and quantity of special educational services to the aurally and visually impaired can be divided into two groups: those involving the education service directly, and those involving other complementary services that also affect the child's education. Improvement of special education is especially significant to the parents of sensorially handicapped youth we surveyed; they overwhelmingly rated education as the most important service.

SUMMARY RECOMMENDATIONS FOR IMPROVEMENT

Improving Special Educational Services

- Preschool educational programs for aurally handicapped youth should be enlarged, because early intervention can be very important to the development of those children's language and communication skills. Instruction can be given directly to the child, as well as indirectly through parents, and programs to train parents to give instruction should be encouraged.
- Education agencies should be given stronger incentives and increased capabilities to provide special educational assistance to a much larger number of hearing and vision handicapped youth. Doing so would require a greater supply of special education personnel. And to permit the delivery of appropriate services, the comprehensiveness of types of special educational assistance available in each geographic region needs to be improved. At the state level, and in regions within the state if the prevalence of handicapped youth permits, assistance should be available that is appropriate to the child's age, type of handicap, and degree of handicap.
- To enable better planning, information on special education should be improved by means of research and evaluation. Information on some of the most crucial variables that present policies are based on is either totally lacking or of very poor quality.

Improving Services Complementary to Special Education

Certain services are not strictly educational, but are very important to the successful implementation of special education programs. They include identification, sensory aids, and direction services.
- Many children may not be served because their handicaps are not identified. In Chapter 4 we recommended screening all children for hearing and vision impairment.
- Sensory aids can significantly improve the child's ability to benefit from education. In Chapter 7 we recommended that these aids be available to all handicapped youth who can benefit from them.
- A direction service can aid the education process by informing parents where they can obtain services such as health care, sensory aids, or compensatory education services. Since these services often are not provided in schools, but may be essential if the student is to obtain maximum benefit from the education system, it would be very desirable to couple the school system with the Direction Center concept discussed in Chapter 3.
NEED FOR SPECIAL EDUCATIONAL ASSISTANCE

A handicapped youth's need for and right to education is generally accepted in the United States. The U.S. Office of Education has set a goal of service to all handicapped youth by 1980; numerous states have laws specifically mandating education for all handicapped youth; the families we surveyed all cited the need for education and overwhelmingly rated education as their most important service need. The courts have been active recently in mandating that mentally retarded and other types of handicapped youth be educated, and it is possible that the court rulings will be expanded in the near future to include hearing and vision handicapped youth. While there is agreement that handicapped youth need special educational assistance, there is disagreement over what constitutes a severe enough impairment to handicap the child in obtaining an education, and what special assistance should be provided.

Need is a relative matter. For our purposes here, we have adopted the following definitions of youth who need special educational assistance distinct from that given nonhandicapped youth:

- A hearing impaired youth needs such assistance if he has frequent difficulty understanding normal speech. In terms of average decibels of uncorrected hearing-loss in the better ear, that difficulty is considered to occur when the loss is approximately 40 dB or more (ISO) in the 500 to 2000 Hz range. If the loss is correctable to the point where he has little difficulty understanding normal speech, he may need no more assistance than a hearing aid and a seat near the front of the class. But if the youth is profoundly deaf, he needs a great deal of special assistance.

- A visually impaired youth needs special assistance if he is unable to read normal newsprint. In terms of acuity with correction in the better eye, that is generally considered to occur at 20/70 or worse. As with hearing impairment, the special assistance needed clearly depends on the degree of impairment.

By these definitions, about 379,000 hearing handicapped youth aged 2 to 18, and 123,000 visually handicapped youth aged 5 to 18, needed special assistance in the United States in 1970. The age of need for special assistance in education extends to the preschool years especially for the more severely aurally handicapped, who need help in developing language and communication skills.

We stress that there is a continuum of degree of need; placing children in special classes for the handicapped or in residential schools are only two ways of helping youth. Many of these youth need special assistance, such as sensory aids, but can still be educated in regular classrooms. BEH estimates\(^1\) of those visually impaired youth in need are significantly lower than ours primarily because BEH does not include the less severely visually impaired, who may need only sensory aids.

There are major gaps in knowledge concerning what types and amounts of special educational assistance are most appropriate to meet the needs of youth with each type and degree of hearing or vision handicap; therefore, we can hardly be definitive on the subject. Later, we recommend that a major research effort be launched to fill this serious knowledge gap, especially since parents we surveyed feel education is the handicapped child's most important need, and since more money is expended on this service than on any other.

The following is a review of current education programs for hearing and vision handicapped youth. For a more detailed description of these programs, refer to Sec.

\(^1\) The U.S. Bureau of Education for the Handicapped estimates that children aged 0 to 19 who needed service in FY 1969 numbered 69,800 and 400,900 for the vision and hearing handicapped, respectively.
6 of our companion report, from which data appearing here are drawn unless otherwise indicated.

CURRENT STATE AND LOCAL EDUCATION PROGRAMS

As they do for the "normal" child, state and local governments bear the major responsibility for the education of the handicapped child. Table 8.1 presents data for their expenditures for special education, and on the number of children served. (For more detail, such as a breakdown by state, see our companion report, R-1220-HEW.)

Hearing and vision handicapped youth receive some 9 percent ($212 million) of total state and local expenditures ($2,364 million) on special education of the handicapped, although they constitute only 3.7 percent of those served. This disparity arises primarily because the unit costs of education programs are higher for these children than for some other handicapped children, such as the speech-impaired. However, these costs appear high partly because of the way special education expenditures are budgeted. Services rendered to handicapped children in regular schools are often not counted in special education expenditures—for example, their share of such costs as education in the classroom with normal children, libraries, maintenance, and utilities. In a residential program, however, all of these costs are counted as special education expenditures. Since the proportion of handicapped youth in residential schools is greater for hearing and vision than it is for other handicaps, there is naturally some upward bias in the relative cost of their programs. It is estimated that at least 20,000 hearing handicapped and 10,000 vision handicapped children are served in state-operated or state-supported schools, many of them residential. The remainder are served by local education agencies.

Table 8.1
STATE AND LOCAL EDUCATION PROGRAMS FOR HEARING AND VISION HANDICAPPED CHILDREN: FY 1973 ESTIMATES

<table>
<thead>
<tr>
<th>Type of Handicap</th>
<th>Expenditures</th>
<th>Number Reported Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard of hearing</td>
<td>$55,000,000</td>
<td>55,000</td>
</tr>
<tr>
<td>Deaf</td>
<td>$91,000,000</td>
<td>28,000</td>
</tr>
<tr>
<td>Visually handicapped</td>
<td>$66,000,000</td>
<td>28,000</td>
</tr>
<tr>
<td>Total</td>
<td>$212,000,000</td>
<td>111,000</td>
</tr>
</tbody>
</table>

CURRENT FEDERAL PROGRAMS

Federal Assistance for Education of the Handicapped consists of numerous programs under a variety of agencies. A capsule review of those that serve the hearing

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3 U.S. Bureau of Education for the Handicapped, Aid to the States Information System, National Report, September 1971, p. 9, hereafter cited as National Report. This is the number of children receiving aid through the P.L. 89-313 program.
and vision handicapped is given below. These programs can be put into one of three classifications, according to whether funds are used primarily for direct support of instruction, for indirect support through the production of educational resources such as teachers and audiovisual material, or for research.

**Direct Support of Education**

*Education of the Handicapped Act (EHA), Part B.* Under provisions of this Act, grants are made to the states to support education of handicapped children through initiation, expansion, or improvement of programs at the preschool, elementary school, and secondary school levels. The stated purpose is to stimulate state and local investments in special education. In 1970, an estimated 12 percent of program funds went to hearing handicapped children and 4 percent to visually handicapped children. Assuming these percentages were the same in 1972, of total expenditures of $37.5 million, $4.5 million went to hearing and $1.5 million to vision handicapped children.

*Elementary and Secondary Education Act (ESEA) Title I.* Grants are provided to local education agencies for the education of children from low-income families. These funds are used to expand and improve educational programs for educationally deprived children. Handicapped children can also benefit from Title I, in three ways:

1. Handicapped children make up part of the educationally deprived population, and as such they can benefit from the increase in school resources along with their nonhandicapped peers.

2. Title I can be used to provide special education services to handicapped children where state law does not mandate such services. It has been estimated that $28 million was given to local education agencies in FY 1972 under Title I for that purpose. Data are not available on the distribution of these funds among handicaps, but it probably resembles that of EHA Part B funds, which also are expended in accord with the priorities of state and local officials. If so, it is estimated that in FY 1972 $3.4 million was directed to hearing and $1.1 million to vision handicapped children. These and some of the later estimates in this section are based on assumptions that must be made because of the dearth of available data, a situation we recommend be rectified.

3. Under an amendment to Title I (P.L. 89-313), schools for the handicapped supported or operated directly by the state are eligible for grants. In 1970, according to the National Report, 18 percent of program funds under P.L. 89-313 went to hearing and 6.4 percent to vision handicapped children. Assuming these percentages were the same in 1972, $10 million was spent on hearing and $3.6 million on vision handicapped children.

*ESEA Title III: Supplemental Education Centers and Services, Guidance, Counseling and Tests.* This title is intended to help schools develop and establish exemplary elementary and secondary school educational programs to serve as models for the regular school program. States are required to spend at least 15 percent of their allotment on the handicapped. The reporting on the number and type of handicapped children served under this program is not adequate for making reliable estimates of the distribution of expenditures among handicapped groups. However, assuming that expenditures are distributed the same as EHA Part B funds, it is estimated that $2.4 million went to hearing and $0.8 million to vision handicapped children.

*Headstart: Economic Opportunity Act.* A new provision in the legislation authorizing the Headstart program requires that 10 percent of the nationwide enrollment opportunities be reserved for handicapped children. This program has not
been established long enough to indicate what types of handicapped children will be served. If we assume that these expenditures will follow the same pattern as for EHA Part B program funds, then $4.0 million will be spent on hearing and $1.3 million on vision handicapped youth.

Vocational Education Act of 1963, As Amended. This act provides that 10 percent of the vocational education funds allocated to each state must be spent on the handicapped. Again, the allocation of those funds among handicap groups is not known. If we again assume funds are allocated in the same manner as EHA Part B expenditures, it is estimated that of the total of $38.4 million set aside for handicapped children under this act, $4.6 million went to hearing and $1.5 million to vision handicapped children in FY 1972.

Higher Education Act Amendments of 1968. This Act provides for grants to colleges and universities to help them develop programs for the disadvantaged. It has been estimated that $0.4 million was spent on all the handicapped in FY 1972. Given the small size of this program, we have not estimated the expenditures for sensorially impaired youth, since those funds would not make a significant difference in the total amount going to hearing and vision handicapped youth.

Federally Sponsored Schools for the Deaf. The federal government sponsors several schools for the deaf: Gallaudet College; the Kendall School for deaf children; the Model Secondary School for the Deaf; and the National Technical Institute for the Deaf. The total spent on these programs in 1972 was $14.5 million.

Special Target Groups. The federal government sponsors two relevant educational programs for special target groups. EHA Part C provides model centers for deaf-blind children. In 1972, $7.5 million was spent for these centers. Although a child has to be both hearing and vision handicapped to be eligible for service, for our calculations we have divided the funds equally between the two categories.

The Early Childhood Education section of EHA supports demonstration programs in preschool education for handicapped children. Early education is especially important for the more severely aurally handicapped youth, since it is in this age period that a child learns the fundamental communication skills. Unless the auditory handicap is identified and remedial action taken, the child’s development may be significantly retarded. This program had expenditures of $7.5 million in 1972. Of the 24 projects originally funded under this program, only three were for hearing handicapped children and none were for visually handicapped children. Assuming that the composition in original projects is representative of present expenditures, $0.9 million would be spent on hearing and nothing on vision handicapped children (but some funds probably now go to the visually handicapped).

Federal Programs for Instructional Support

The federal government also sponsors programs that produce resources for special education. Teaching personnel are developed under two programs: EHA Part D and the Education Professions Development Act (P.L. 90-35). In the absence of data on the specialization of personnel trained under these two programs, we apportioned funds in accordance with an estimate of the number of teachers presently serving each type of handicapped child. This estimation method is subject to error when there is a change in emphasis among handicap groups. The estimated expenditures under EHA Part D were $2.3 million for hearing and $1.1 million for vision hand-

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icapped youth. Corresponding expenditures under EPDA were an estimated $0.4 and $0.2 million, respectively.

Regional Resource Centers are sponsored under EHA Part C. These centers develop curricula, train personnel, and disseminate information about effective practices in the instruction of the handicapped. In the absence of data it is assumed that the costs of this program can be allocated to each handicap in proportion to its share of EHA Part B expenditures. This means that an estimated $0.4 million went to hearing and $0.1 million to vision handicapped youth.

Under EHA Part F, captioned films are made available to the deaf; a National Center of Educational Media and Materials for the Handicapped is supported, and media related research is funded. The National Center and other depositories around the country can aid local school districts in supplementing their media inventory. While some of the activities sponsored under this section can be directly allocated to handicapped groups, most cannot. After a careful review of these activities, it appeared that of the $10.5 million appropriation, approximately $4.8 million was for services to hearing and $1.3 million to vision handicapped youth.

Another media program supported by the Federal government is the American Printing House for the Blind (APHB) in Lexington, Kentucky. APHB provides books and other material for the visually impaired. Federal expenditures under this program were $1.6 million in 1972.

The Library of Congress also sponsors a media program that provides free loan books and magazines and records for the “blind and physically handicapped.” It has been estimated that a little over $1 million was spent on visually handicapped youth.

Federal Research Programs

A significant percentage of the federal funds devoted to the handicapped could be classified as research expenditures. ESEA Title III and EHA Part B are devoted at least partially to experimentation in methods of education for the handicapped. For the purposes of this report, however, “research” is limited to that item termed research in the authorizing legislation.

EHA Part E provides for research grants and demonstration programs in the education of the handicapped. Actual expenditures for hearing and vision handicapped youth were $1.3 and $1.1 million, respectively, in 1971.9

Federal Emphasis on the Sensorially Handicapped

The distribution of funds for hearing and vision handicapped youth among the three categories, Direct Support of Education, Instructional Support, and Research, corresponds generally with that for all handicaps. Of the total for these two groups, an estimated 80 percent is spent on direct education (see Table 8.2). For all handicap groups this percentage is 77 percent.

The federal government lends relatively heavier support to the education of hearing and vision handicapped children, however, than it does to the overall education program for the handicapped. It was found that the largest percentage of funds for all types of handicapped youth combined was used to stimulate state and local effort in special education. The federal role in the education of youth with impaired hearing or vision appears to be one of more direct service and basic support, in addition to stimulation. The federally supported schools for the deaf, the Deaf-Blind

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Table 8.2
FEDERAL EDUCATION EXPENDITURES ON HEARING AND VISION HANDICAPPED YOUTH
(In $ million)

<table>
<thead>
<tr>
<th>Program</th>
<th>Type of Handicap</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hearing</td>
</tr>
<tr>
<td>Direct support of education</td>
<td>48.1</td>
</tr>
<tr>
<td>EHA Part B</td>
<td>4.5</td>
</tr>
<tr>
<td>ESSEA Title I</td>
<td></td>
</tr>
<tr>
<td>Local education agencies</td>
<td>3.4</td>
</tr>
<tr>
<td>P.L. 89-313</td>
<td>10.0</td>
</tr>
<tr>
<td>ESSEA Title III</td>
<td>2.4</td>
</tr>
<tr>
<td>Headstart</td>
<td>4.0</td>
</tr>
<tr>
<td>Vocational Education Act</td>
<td>4.6</td>
</tr>
<tr>
<td>Federal schools for the deaf</td>
<td>14.5</td>
</tr>
<tr>
<td>Special target groups</td>
<td></td>
</tr>
<tr>
<td>Deaf-blind centers</td>
<td>3.7</td>
</tr>
<tr>
<td>Early education</td>
<td>0.9</td>
</tr>
<tr>
<td>Instructional support</td>
<td>7.9</td>
</tr>
<tr>
<td>Teaching personnel</td>
<td></td>
</tr>
<tr>
<td>EHA Part D</td>
<td>2.1</td>
</tr>
<tr>
<td>Education Professions Development Act</td>
<td>0.4</td>
</tr>
<tr>
<td>Regional resource centers (EHA Part C)</td>
<td>0.4</td>
</tr>
<tr>
<td>Media</td>
<td></td>
</tr>
<tr>
<td>American Printing House for the Blind</td>
<td>0.0</td>
</tr>
<tr>
<td>Library of Congress</td>
<td>0.0</td>
</tr>
<tr>
<td>EHA Part F</td>
<td>4.8</td>
</tr>
<tr>
<td>Research: EHA Part E</td>
<td>1.8</td>
</tr>
<tr>
<td>Total</td>
<td>57.3</td>
</tr>
</tbody>
</table>

Centers, and the American Printing House for the Blind are examples of heavy federal involvement in the direct provision of service. The P.L. 89-313 program is an example of basic service support to state-operated and state-supported schools for the handicapped. This difference in role emphasis is relatively more expensive for the federal government; while it provides only 12 percent of the funds for all special education, it provides 27 percent of the estimated $289 million expended for special education of hearing and vision handicapped youth.

Many explanations are possible for this differential federal role. First, the state-operated and supported schools receiving P.L. 89-313 funds have relatively heavy emphasis on the sensorially impaired. Second, vision and hearing impairments are the two handicaps of lowest incidence, which implies that some programs must be at the national level to achieve economies of scale. The higher education programs for the deaf, the Deaf-Blind Centers, and the educational media production programs are three examples where federal or multistate involvement could be justified to achieve such economies. Third, the relative political strength of the various handicap groups historically has shaped the present federal program. The visually handicapped, for example, are generally regarded as having strong political power through their various lobby groups.
COSTS AND EFFECTIVENESS OF THE CURRENT PROGRAMS

Lack of Information for Planning

Reliable analyses of the cost and effectiveness of special educational services require information that is not presently available. Given the high cost and importance of these services, this lack of essential planning information is critical, and we recommend a major federal effort to rectify the situation. The program is attested to by the U.S. Office of Education's own evaluation report. In that report's evaluations of all education programs serving the handicapped, all but two contained a statement like the following: "No formal evaluations have yet been conducted of this program and its effectiveness cannot be ascertained from reports now available." And the remaining two programs were "evaluated" in that report in terms of the number of teachers trained and the volume of media services offered.

In brief, no one has sufficient information to adequately evaluate the effect of any of these special education programs. At the project level, evaluation information is often required as a condition of funding, but our observations suggest that such project level evaluations are more often perfunctory than substantive.

In the absence of reliable evaluation information, we venture some order-of-magnitude estimates in the following subsections.

Program Cost

In our companion Rand report, R-1220-HEW, we estimate that the average annual special education expenditure per child served in the United States is $879 for all handicaps combined, but ranges from $197 for the speech impaired, to $1247 for the hard of hearing, to $3043 for the visually impaired, to $4767 for the deaf. Since the speech impaired generally are served on a part-time basis by itinerant specialists, the $197 figure is thought to be the excess cost of serving one such child above the average regular education expenditures of $776 per child. However, since most deaf children are not educated in a classroom with "normal" children, the $4767 figure is thought to be close to the total annual cost of educating one such child; hence we arrive at an excess cost of $4767 minus $776, or about $4000 per year using current methods of education and the current average student-teacher ratio of about 6 to 1. Since the average reported annual special education expenditure per hard of hearing child served in the United States is $1247, the corresponding excess cost for hard of hearing youth would be between approximately $1247 (if one assumes that reported expenditures were all for youth in regular classes), and approximately $471 (if one assumes that reported expenditures were all for special classes for the handicapped); an average excess cost of approximately $800 is probably the correct order of magnitude.

Using the same reasoning, the average excess cost for visually handicapped youth is between $2267 and $3043; an estimate of approximately $2600 is probably the correct order of magnitude. Of course, this is for current methods of educating these children, and could reasonably be as high as $4000 for the totally blind and as low as $800 for the partially sighted. We caution that if services were to be expanded to reach allaurally and visually handicapped youth, the mix of types and

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7 Average student-teacher ratios used here and later in this section were calculated from data in U.S. Bureau of Education for the Handicapped, Handicapped Children in the U.S. and Special Education Personnel Required, August 1970.
degrees of handicaps would change, and hence the overall average costs would change.

One recent study of costs\(^8\) indicated major variations in reported special education costs among school districts, which partially reflect differences in the special education programs offered and partially reflect variations in resource prices and accounting methods.

**Economic Benefits**

Data are not available on future earnings and future services required as a function of the type and amount of special education given to a child. Hence, we cannot say definitively if these expenditures are justified on an economic benefits basis. We can, however, say what these economic benefits would have to be in order to justify special education on a purely economic benefits basis. (This is a very narrow way of measuring program effect. We do not subscribe to it, and we will discuss other criteria of effect shortly.)

Let us assume that a child receives special education services at an excess cost of $800 a year for 12 years. He then enters the labor force and works until he is 55. What increase in monthly income will equal the cost of special education if both costs and income are discounted at 8 percent? The answer is that the handicapped child must earn some $108 a month more after receiving special education services to justify the program in these simplistic terms. It is not difficult to conceive of the 12 years of special education raising the earnings of the handicapped by this small amount—about 63 cents an hour. Thus, it appears that extra expenditures on the order of $800 per year can be justified on purely economic benefits terms (however, data are not available to prove this conclusively.) On the other hand, the increase in earnings necessary to offset a $4000 per year excess expenditure for special education is about $540 a month. Expenditures of $4000 per year for a severely handicapped child may or may not be justified on purely economic benefits terms; however, economic benefits are only one of many factors that should be considered.

**Academic Achievement**

Difficulties also are encountered when the effectiveness of special education programs is considered from the viewpoint of academic achievement. While studies of the intelligence of hearing and vision handicapped children indicate that as a group they generally are normal, they are still handicapped in their ability to learn by their impairment in receiving or communicating information. Consequently, both students and education agencies may have to exert a great deal of extra effort if these youth are to reach normal academic achievement levels. While the data on achievement testing of these youth are incomplete and not representative of all sensorially handicapped students, they suggest that there is significant room for improvement. For example, test results for 12,000 hearing impaired students in special educational programs throughout the United States indicated that they were achieving at a grade equivalent level approximately half that of normal schoolchildren.\(^9\)

Similar types of data on visually handicapped children were not located.

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\(^9\) *Academic Achievement Test Performance of Hearing Impaired Students: United States*, Office of Demographic Studies Report, Series D, Number 1, Gallaudet College, Washington, D.C., 1969. This is one in a series of publications that provide much useful information on current education programs for the hearing impaired.
Quality-of-Life Effects

In our companion report, we suggested several scales for measuring the effects of a program on the quality of life of handicapped youth. Since statistically reliable data are not available to use any of those scales, we are forced to rely on opinion: the parents we surveyed gave extremely high ratings to the value of special education (see Chapter 11 for details); and the consensus in the literature and among education professionals we interviewed at the federal level, and in five states, indicates that program effects outweigh costs and that all handicapped youth should receive special educational assistance.

Since special education for the most severely handicapped may not be justifiable on purely economic benefits grounds, it also must be considered on these quality-of-life, humanitarian grounds. Again, we point out that statistically reliable comprehensive evaluations of the impacts of special education programs have not yet been conducted, nor is the abundant literature on the impacts of single projects adequate to support the major program decisions that must be made.

Of course, it is possible that the educators who say more funds should be devoted to these programs are incorrect, and that the legislators who have significantly increased funds for them are incorrect, and that the parents whose children are part of these programs are mistaken in their judgment on their usefulness. But our considered judgment is that these programs yield good and effective results.

Equity of Service Distribution

One possible objective of the service system is to distribute services equitably or "fairly"—for example, to give similar treatment to every handicapped child with the same type and degree of disability. But by nearly any definition of equity that might be chosen, the distribution of special education services is grossly inequitable. In terms of the likelihood of a 5-to-17-year-old youth receiving any special educational assistance, the variation across states is extreme: from apparently serving less than 10 percent of the visually handicapped in two states to serving most of them in five other states; from apparently serving less than 10 percent of the hearing handicapped in five states to serving most of them in at least four other states. (These figures are obtained by applying national prevalence data to the individual states.) Using BEH estimates of the prevalence of youth aged 5 to 17 needing special educational assistance, we estimate that 21 percent of the hard of hearing, 72 percent of the deaf, and 55 percent of the visually impaired youth were served in the United States in 1972-73.

In terms of the amount of assistance received per child in a special education program, as measured by average reported special education expenditures, the variation across states is extreme: from less than $500 for each hearing or vision handicapped student served, in several states, to more than $3000 in several other states.

Intrastate variations in service levels are probably as large as, if not larger than interstate ones. Given the large variation in expenditures among school districts for regular education programs, it can only be expected that these same variations hold with respect to special education. Nonetheless, a child's receipt of special educational assistance, and the amount he receives, are unmistakably and strongly dependent on where his parents live. This means that many handicapped children will either be denied educational service because of where they live, or they will be forced to move to districts where such services are available (1 in every 10 of the families we surveyed had moved to obtain special education for their children). Such a system is undesirable from several standpoints. First, it creates disincentives for local dis-
districts to sponsor outstanding special education programs. If they do, they are likely to attract handicapped children from outside the district and necessarily raise the budget of the school or divert resources from the regular education program. Secondly, it requires that families having handicapped children bear the burden of moving costs, possible loss of jobs, etc., to obtain adequate public service. Thirdly, it means that the children of some who cannot or will not move will receive inadequate special education services. The analysis in our companion report, R-1220-HEW, suggests that handicapped youth receive more assistance (as measured by expenditures per child served) in higher-income states. Some of these differences in expenditures are due to price differences between states. The differences are so large, however, that most of them must be attributed to differences in service levels.

Preschool-age youth and the less severely impaired also are less likely to receive special educational assistance.

NEEDED IMPROVEMENTS IN SPECIAL EDUCATION PROGRAMS

Crucial improvements needed in the delivery of special educational assistance to hearing and vision handicapped youth are discussed here; our recommendations appear in italics.

*Increase the fraction of school-age hearing and vision handicapped youth receiving special educational assistance, and concomitantly increase personnel and the comprehensiveness of special educational assistance available in each geographic area.*

Principal arguments in favor of these increases are: Parents overwhelmingly point to special education as their child's most important need; these increases would reduce the inequity of present service delivery; the courts are moving in the direction of mandating such service as a "right"; such assistance appears to be cost-beneficial in an economic sense, as well as humanitarian, for the less severely handicapped; and such assistance appears to be justifiable on humanitarian grounds for the more severely handicapped.

The principal argument against this increase is the cost. If service were expanded to all youth in need aged 5 to 17 at the same excess expenditure rate prevailing for those currently served, and if we used BEH estimates of the prevalence of those youth needing service, then an estimated total budget increase of approximately $269 million a year would be required ($209 million for the aurally handicapped, $60 million for the visually handicapped). In themselves, these are not prohibitively high expenditures. The problem of cost is primarily due to the likelihood that a school district which began serving all sensorially handicapped youth would forthwith come under extreme pressure to serve all other handicapped youth — and that would require adding about $2.5 billion a year to special education budgets in the United States.

One might start by serving all of the blind and the deaf, since their handicaps are two of the severest and they comprise a small enough population so that certain aspects of expanding service to the total population in need could be tested at relatively low cost.

As the number of youth served grew, there would be an opportunity to expand

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10 See R-1220-HEW, Sec. 6.
11 These differ from the estimates in R-1220-HEW, which are not adjusted to represent expenditures in excess of those for regular educational programs.
programs in ways that would reduce the current inequity of geographic distribution. At a minimum, each state could provide a full range of types of special educational assistance appropriate to the different ages and types and degrees of handicaps. That is not done currently. If the prevalence of the types of handicapped youth permits, then services appropriate to that type of child should be available in appropriately sized intrastate regions. As an example of inappropriate service, a 1969 survey of educational programs for hearing impaired youth found that "Almost one-third of the children in the schools for the deaf are reported to be educationally hard of hearing [but the schools] are generally unable to provide the necessary special services for hard of hearing children, and instead, place the children in classes with deaf children." Further, the schools for the deaf reportedly are forced to take these hard of hearing children because they are the only facilities available in the area that provide special help for the aurally handicapped.

Of course, an increase in the number of children served would require a concomitant increase in special education personnel and facilities. Using BEH estimates of the desirable ratio between students and special education teachers for the currently unserved population aged 5 to 17, we calculate that approximately 11,500 new specialists in education of the sensorially impaired are required: 9900 for the aurally handicapped and 1600 for the visually handicapped.

The question of sufficiency of resources depends on the objectives set in special education. That is, unless one knows what has to be achieved, it is impossible to calculate the resources necessary to achieve it. Objectives can be framed by answering two questions: How many children should be served? What level and type of service should be offered? It is easy to say that every child should be served, and served so generously that he reaches his maximum potential. But with the limited amount of funds available both for current programs and for incremental changes, it is necessary to make hard choices between the number of children served and the quality of service.

The current trend is to extend the program to more children rather than to increase the quality of existing programs. The implicit reasoning behind these priorities appears to be that existing programs are typically subject to minimum standards of quality (e.g., student-teacher ratios) to prevent their becoming ineffectual because of low budgets; and in many situations there are decreasing returns from investment. That is, an additional dollar spent on a child already in a program will not buy as much in effectiveness as it would buy if spent on a child who has been receiving no service. The trend to expand services to more children is logical if one considers the parents' comments to us: they were generally satisfied with the quality of special education received, but reported difficulties in getting into the programs (see Chapter 11 for details).

Potential federal activities in supporting the expansion of special education services to hearing and vision handicapped youth include: direct provision of services, financial aid to state and local governments, regulations associated with financial aid, court rulings, investment in service manpower and facilities, and stimula-

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13 U.S. Bureau of Education for the Handicapped, Handicapped Children in the U.S. and Special Educational Personnel Required, Washington, D.C., August 1970. Student-teacher ratios were calculated from that document by dividing teachers (teachers needed) by the number of served (unserved) youth. The ratios for served and unserved youth are different because the population served is more severely impaired and needs more intensive service. For unserved youth the ratios of special education personnel, exclusive of regular teachers serving some of these youth, are: hard of hearing, 23 to 1; deaf, 9 to 1; visually impaired, 14 to 1. Actual ratios for currently served youth: hard of hearing, 11 to 1; deaf, 6 to 1; and visually impaired, 6 to 1.
tion of service provision through research, demonstration, and information dissemination. In most other program areas the federal government uses a mixture of these activities, and in special education all of them exist to a limited extent. The best choice of federal role in special education will probably continue to include a hybrid mixture of these activities.

While it may be feasible for the federal government to provide all special education to handicapped youth directly, it would clearly be inefficient to bypass state and local governments, which already possess the administrative machinery and resources for regular education services. Direct federal provision of services may be justified, however, for very limited types of special educational services or for very-low-incidence population groups: in both cases, the population served is so small that it is uneconomical for a single state to mount a high-quality program on its own. For example, deaf-blind youth and profoundly deaf youth needing higher education are two very-low-incidence population groups currently served on an interstate basis. Even in these situations, however, the federal government might choose to fund a service center through a single state, with regulations for admission of youth from other states, rather than directly operate a service center without state involvement.

Federal financial aid to state and local government earmarked for special education is clearly a major feasible option. Education historically has not been an area of heavy federal involvement relative to total education expenditures from all sources. Not until the passage of the Elementary and Secondary Education Act of 1965 was the federal government a major significant supporter of local education. A basic reason for this inactivity was the view that education is state and local responsibility. Why, then, might the federal government consider becoming heavily involved in the support of special education? Let us review some of the major arguments.

An equity argument in support of federal financial aid is that poor states do not have the resources for an adequate special education program, and the federal government, while giving aid to all states, might favor poorer states and in effect transfer funds from wealthy to poor states to enhance equal special educational opportunity. Of course, every state does have sufficient resources to support an adequate special education program, but it must choose to do so. For example, only about 1 out of 10 school-age youth are handicapped; if state officials wanted to spend twice as much per handicapped child as per nonhandicapped child, and they increased the fraction of handicapped youth served by special education from 50 percent to 100 percent, the total education budget would need to increase by only about 5 to 7 percent, depending on one's assumptions about the percentage presently excluded from school altogether. Since primary and secondary education accounts for only about 32 percent of state and local expenditures, only about a 2 percent increase in total state and local expenditures would be needed to finance the needed expansion in special education services in this example. It is not fair, however, to view special education needs in isolation from the other pressing problems faced by states and localities. Poorer states are at a disadvantage in providing many social services. To provide a uniformly high standard of service could mean high state and local tax rates, which, in the long run, might not be in the best interests of the poor states or the nation as a whole. Therefore, the equity argument provides some support for allowing the federal government to help special education financially,

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14 Education accounted for 40.5 percent of state and local general expenditures in 1969 (1971 Statistical Abstract, p. 404). Higher education accounted for 20 percent of all educational expenditures (ibid., p. 403). Therefore only about 32 percent of all funds went for primary and secondary education.
thereby allowing all states, rich and poor, to provide an equivalent level of service for equal tax effort.

An externality of benefits argument in support of federal financial aid for special education is that its benefits are bestowed upon the nation as a whole, in the form of an informed and well-trained citizenry, and that federal welfare and other service costs for handicapped persons are reduced when special education is provided. According to this argument, without federal support the handicapped person, and state and local authorities, might underinvest in special education to the detriment of society, because some benefits of special education do not accrue to the single individual, state, or locality. A highly mobile populace and federal funding of other noneducation services are two causes of benefits accruing beyond state boundaries. To have a nationally optimum level of investment in special education, then, the tenor of this argument is that federal supplement is required to equate total marginal social benefits with total marginal social costs. Nevertheless, it is difficult to construct a case where the external (interstate) effects of special education are large in relation to the intrastate effects. The most serious deprivations inflicted by small investment in special education will be borne by the handicapped and their families, not by other citizens.

Another argument for federal financial aid for special education is that there is a large unmet service need; some level of government should meet the need; state and local governments are not meeting the need; therefore the federal government should. A counterargument is that regulation without financial aid might be sufficient, a contingency discussed later in this section. In considering this argument for financial aid, it is important to try to understand why state and local levels of government are not meeting the need. Possible explanations are that the problem is not as large as it appears; that many state and local decisionmakers do not view special education as a high-priority program; or that these unserved children would be served if they were identified. As indicated in Chapter 6 of our companion report, R-1220-HEW, the extent of unmet need is extremely large, but less than popular estimates would suggest. Moreover, it appears that state and local governments may be mobilizing greater resources for their special education programs. In 1968-69, it was reported that state and local governments spent $1.3 billion dollars. Our estimate for 1972-73 of $2.4 billion is not directly comparable, but it is clear that state and local efforts in this area are increasing. And, clearly, if the states wished to serve more handicapped youth, they could implement identification programs to find those youth. Another possible explanation for insufficiency of funds in special education rests on the institutional structure of resource allocation: who makes decisions, and the incentives facing the decisionmaker. A simplistic model of this decisionmaking process includes the public, the school board, and the superintendent. In preparing the budget, the superintendent faces pressure from both the parents and the employees of the district. Confronted by increasing costs of providing regular education, the superintendent may perhaps feel compelled to maintain support of the majority of both groups, to the disadvantage of handicapped children and their parents, a small minority by comparison.

The school board is responsive mainly to voters. Assuming that a board member wants to be reelected, coalition-building among the majority of parents and nonparents who live and vote in the school district naturally follows. Parents are primarily


concerned with regular education, and nonparents are often resistant to increases in the tax rate; together, these two groups are a force against increasing school expenditures. Parents without handicapped children are generally concerned with visible signs of progress in their child's education, along with other indicators of the overall quality of the school. Appealing to these interests, a school board may emphasize programs that boost student achievement scores on statewide tests, intramural athletics, or drug prevention programs. Again, as with any minority group, it is hard for the handicapped to exert a heavy influence on the board's decisions.

The model presented above is overdrawn for the purpose of emphasis. Decisionmaking at the local school district level is not as simple as the model suggests. Our model, however, is not in basic disagreement with the findings of more careful examinations of the school budgeting process. 17

While much the same arguments can be made for state-level decisionmaking, the federal government, for a variety of complex reasons, has lately been in the forefront in protecting the rights of minorities. Should federal dollars be spent in support of the handicapped minority to protect its rights? The answer is not clear, but as with other minorities, the federal government appears to be the most likely, if not the only, candidate to redress grievances. If the federal government were to undertake a large financial role in special education, the best mechanism for doing so is also unclear. Earmarking funds for special education would probably be required, presuming that general education revenue-sharing would not alter the local and state decisionmaking incentive structures that have in the past helped create a large fraction of unserved handicapped youth. Any noncategorical revenue-sharing aid would have this same effect. Despite a recent trend in federal funding away from categorical aid, such a shift is likely to hurt the interests of the handicapped if our model of decisionmaking has validity. Long-term, federal financial support may not be necessary to achieve desired special education objectives, nor for that matter would it even be healthy. Major impediments to increasing special education expenditures include at least the following concerns: current program inertia, large initial costs, an insufficient number of identified handicapped youth, and a lack of organized clientele demanding special education services. Each is basically a short-run phenomenon, and taken together they serve as constraints against starting programs but not against continuing them, if even at less than optimal levels. Therefore, a reasonable federal policy might be to overcome these constraints by funding start-up activities, e.g., special education teacher training, facilities construction, and identification, on a large enough scale to fill the unmet need; furthermore, the start-up problem could be lessened if the federal government were to adopt a stimulation role by funding costs of special education above the costs of regular education for perhaps five years, with a gradually decreasing federal contribution and a gradually increasing required state "match," thus allowing time for the increased state and local programs to "catch on."

If federal financial aid is given to states and localities, regulations could be implemented to earmark the funds for special education and to encourage the states to offer a comprehensive range of services to meet the needs of youth of each age, with each type and degree of handicap. Regulations governing the geographic distribution of services might also be adopted; however, such regulations are not likely to be politically feasible unless the federal government were to assume a financial role.

Providing special educational vouchers to the handicapped population is another alternative that deserves consideration. Vouchers allow the granting agency to influence the distribution and amount of services to the handicapped, and to escape some of the institutional rigidities of the present system. As is the case with any voucher scheme, it is meant to introduce competition into the market by stimulating the supply of service and by improving the odds that matches will occur between the needs of the individual consumer and the array of services supplied.

A voucher system is no panacea, however. For one thing its potential benefits must be weighed carefully against offsetting administrative costs. For another, there may be no choice of service programs available to the parents. Also, as we have indicated, parents are usually not well-informed consumers and are rarely able to make informed decisions about the best special education program for their child. Parents may have some general familiarity with alternative curricula and teaching methods in a regular school program; but how do they evaluate specific treatments for, and the progress of, the handicapped child? Lacking performance benchmarks, they cannot do so adequately.

Currently, the federal government is heavily involved in activities intended to stimulate state and local special education efforts. However, federal resources expended in such activities are small relative to the absolute requirements implied by the Office of Education's objective to have every handicapped child receive special education by 1980. As a result, heavy reliance is placed on demonstration projects. It is commonly assumed that the influence of demonstration projects will "automatically" diffuse as word of effective practices becomes widely known, but there is little evidence to warrant this assumption.\(^{18}\)

The courts offer another creative source for potentially powerful regulation, as evidenced in recent federal court decisions requiring state and local authorities to provide education service to certain classes of handicapped children.\(^{19}\) Though the courts can be and have been effective in getting some excluded children into the educational service system, this population is only a fraction of those entitled to but not receiving special education. Many handicapped children in the regular school system do not receive needed special services, or they may be ruled ineligible for service because of administrative restrictions related to age. Redressing all the inequities facing handicapped youth through court action on a case-by-case, handicap-by-handicap basis may be feasible approach, but it is also a difficult and inefficient cure.

For court rulings to be effective, the youth must first be identified and defined according to their handicaps. But the special education needs of an impaired child are unique, and they vary markedly. It is difficult for the courts to specify exactly the quantity and quality of special education services that must be delivered, given critical individual differences in needs among the handicapped. However, courts could reaffirm the rights of equal protection of all children by requiring that special education services be given, without specifying the level of service.

Increase preschool educational opportunities for hearing handicapped youth.

The principal argument in favor of this increase is the widely accepted belief among

\(^{18}\) See Robert Klitgaard, Models of Educational Innovation and Implication for Research, The Rand Corporation, P-4977, March 1973, for a discussion of models of the bureaucracy's reaction to innovation. Rand is currently under contract with the Office of Education to see if dissemination is actually working in several of the federally sponsored education programs.

\(^{19}\) Alan Abeson, A Continuing Summary of Pending and Completed Litigation Regarding the Education of Handicapped Children, Council for Exceptional Children, Arlington, Virginia, 1972. See also Chapter 4 of this report for a more detailed discussion of court activity with respect to handicapped persons.
educators of the deaf that if a deaf child does not receive special assistance during the preschool language acquisition years, his development will be seriously and perhaps permanently inhibited. (Data are not available, however, to indicate how many youth would need less special education in later school years if they received that assistance.) For the profoundly deaf child, considerable attention is desirable; the hard of hearing child may need no more than a hearing aid so that he can develop language in the same manner as normally hearing children.

The principal arguments against this increase are cost and the lack of programs for identifying hearing-handicapped children. In Chapter 4 we recommended that a preschool-age identification program be established. As for cost, the cost of preschool-age education for the more severely hearing handicapped would not be prohibitive since we are speaking of a relatively small population. While such education might be desirable for all categories of handicapped youth, the argument for the deaf, based on the language development process as a function of age, is more compelling than any we have heard for other handicaps.

In 1970, 9959 pupils were enrolled in preschools for the deaf.20 Assuming the incidence rates used throughout this study, some 62,000 children aged 3 to 5 were hard of hearing or deaf in 1970. If these figures are accurate, only 16 percent of the preschool deaf or hard of hearing children are being served—far below the corresponding school-age percentage. A recent nationwide survey21 indicated that, of those preschool pupils for whom a better-ear average was obtained in 1969-70, 55 percent had a hearing threshold level of 85 dB or above (ISO); and of those served whose ages at the start of education were reported, almost 40 percent began their education prior to the age of three. Thus, about half those served are those with the greatest need—the profoundly deaf—and nearly half started their preschool training at a desirable early age.

Several reasons for this shortfall in the number receiving preschool education seem evident. First, many states do not permit state-supported preschool education. Other states permit but do not mandate it. State regulation, then, offers little incentive for the local district to become involved with these handicapped children. The lack of identification of these children would of course prevent parents from seeking educational services. And even if they were identified, there are so few of these children that their parents would not constitute a very effective pressure group. Finally, no educational agency is presently responsible for service to this age group.

In reality, both hearing and vision handicapped youth could benefit from intervention in their training at an early age. The visually handicapped need training in using equipment, in mobility, and in other activities of daily living. They also need training in the use of their residual vision. The child may become dependent on others rather than develop his own capabilities. Parents, especially if they do not know what the child is capable of doing by himself, may structure his environment in such a way as to limit his opportunity for development. This blindness orientation in childhood can lead to functional blindness even if the child has some residual vision.

Federal initiative is perhaps more important for establishing preschool programs than for programs for older youth, since preschool-age groups are generally not considered a responsibility of local school districts. Children under age 5 are


likely to continue to get short shrift in budget deliberations unless incentives structured by federal policy make preschool programs for hearing handicapped youth attractive.

Screen all children for hearing and vision impairment. Chapter 4 has discussed the identification of youth needing special educational assistance. It could be argued that such an identification program is not worthwhile if special education services are not locally available. Such reasoning neglects the fact that the educational environment can react differently once the handicap is identified. A teacher, for example, may be more prone to give individualized instruction if he or she knows that the child is handicapped, not lazy or inattentive. The parents could think about remedial treatment from sources other than the public school system. None of the services available from other agencies can be provided until the child is identified. Identification is important in and of itself since the problem must be recognized before it can be solved. The lack of identification may be one important reason why the education system is giving special attention to less than half the sensorially handicapped youth that need it.

Insure that sensory aids are provided to all hearing and vision handicapped youth that can benefit from them. Chapter 7 has discussed the need for and potential benefits from the provision of sensory aids. This type of equipment is especially significant to the child's education. Such aids as corrective lenses and hearing aids can often let the child stay in a regular classroom; without them, he may have to be placed in a more expensive special classroom or suffer educationally. The benefits to be gained from a sensory aid depend on a comprehensive screening program, the provision of instruction in the use, care, and value of the aid, and encouragement of the child in using it.

Increase research and evaluation to obtain better planning information. Research and evaluation can discover better ways of educating handicapped children, and document the results of existing practices. Both kinds of knowledge can be valuable to the planners of new and revised special education programs. At present, planners must proceed in the face of major information gaps. They especially need data on the size and characteristics of the served and unserved populations, and the costs, benefits, and effectiveness of various types of special educational assistance. Despite the lack of reliable information, annual special education expenditures exceed $2.6 billion; reliable information should enable a considerably more effective allocation of these funds.

We suggest, however, that research to create better educational methods should be of a lower-order priority than the evaluation of current methods and research on how current good practices can be disseminated to all youth in need. This call for improved research and evaluation is not meant to imply that current special education programs are ineffective, or that the people who run them have major failings. On the contrary, these people are generally aware that information is limited about what appears to be an effective set of programs, and they are attempting to fill the gaps. We are supporting those attempts and encouraging an expanded research effort, coupled with increased efforts to disseminate and put the results of research into use.

Evaluating the effects of these programs is neither quick nor easy. They are the combined results of numerous program variables such as student ability, family characteristics, peer group characteristics, learning environment, teacher characteristics, and the like, whose relative influence is often difficult to measure.

The rationale for federal activity in research and evaluation is clear. The benefits of research and evaluation enjoyed by one state could be shared by all states.
Because of this externality of benefits, investments in research could reasonably fall below the level of what is socially optimal if such investment decisions are left to the states. And considerable duplication of effort would occur if research and evaluation were left entirely to the states.
Chapter 9

VOCATIONAL SERVICES

INTRODUCTION

This chapter discusses vocational service programs for hearing and vision handicapped youth. It briefly summarizes the need for special vocational assistance; reviews federal and state programs providing that assistance; estimates the benefits and costs of these services; and presents recommendations for improvement.

We estimate that each year approximately 33,000 hearing and vision handicapped youth enter the age range where they may need vocational services. These youth typically have the same mental and physical abilities as "normal" youth, except for their impaired hearing or vision, but their reportedly higher unemployment and underemployment rates are due to various factors, including underestimation of their abilities by potential employers. While it is true that their handicaps impede them in and may bar them from certain occupations, they can be fully productive in many others. By all rights, then, with the possible exception of the multiply handicapped, these youth should be as fully employed and earn as much as young persons who have no sensory handicaps.

The Vocational Education program described in Chapter 8 expends an estimated $6.1 million per year for hearing and vision handicapped youth, but data are not available on program effects for these youth. Vocational or career education is not well developed even for "normal" youth, and the options available to sensorially handicapped youth through this program appear very limited.

The largest vocational service program is Vocational Rehabilitation (VR), which provided a wide variety of different services through state agencies to 6680 hearing and vision handicapped youth whose cases were closed in FY 1970. These services included diagnosis, evaluation, vocational counseling, medical and medically related restorative services, vocational training and job placement, income maintenance while participating in the program, and other services such as sensory aids, mobility training, occupational tools and equipment, and transportation. In a sense, the need for VR to provide services normally thought to be the earlier responsibility of other programs represents a shortcoming of those other programs. For example, nearly half the clients need and are provided medical or medically related services by VR.

The number of sensorially handicapped youth clients whose cases were closed in FY 1970, as a percentage of the number of such youth entering an age range where they may need VR services, was over 100 percent for deaf youth; about 10 percent for other hearing impaired youth; about 57 percent for totally blind youth; and about 21 percent for partially sighted youth. In addition, 4885 visually impaired youth who are not visually handicapped, by the definition we use in this report, had their cases closed in that year.

This program is designed to return handicapped persons to gainful employment, which may include family work, sheltered employment, or gainful homestead work, as well as competitive employment. The $26.1 million per year expended on VR for hearing and vision handicapped youth results in an 84 percent success rate for the 52 percent of such referrals accepted, with success consisting basically of a favorable prognosis after 30 days of gainful employment. Visually impaired youth receive nearly twice the total expenditures that hearing impaired youth receive, and nearly half the expenditures for the visually impaired go for youth who either have one
good eye or some other visual impairment with acuity better than 20/70—youth who are not handicapped according to the criteria used in this report.

Across the states there is extreme variation in the number of successfully rehabilitated youth per 100,000 population aged 14 to 21. For example, the number of totally blind youth rehabilitated per 100,000 ranged from less than 0.1 to a high of 2.2. The figures for deaf youth unable to talk ranged from less than 1 to as high as 9, and for other hearing impaired youth from less than 1 to 17.

At the time of referral, only 14 percent of the rehabilitants were "gainfully employed" and over half were nonworking students; at time of closure, 86 percent were in the competitive labor market, 8 percent were homemakers, and 3 percent were employed in sheltered workshops. The average weekly earnings at closure were $84, and about one-third earned less than $64—the 1970 national minimum wage of $1.60 per hour for a 40-hour workweek—despite being in the VR program for an average of 19 months from acceptance to closure, and despite basic program expenditures of $2103 per youth rehabilitated. Expenditures per youth rehabilitated varied extremely across the states for youth with the same type and degree of handicap. They averaged, for example, $6167 for a totally blind youth, $2068 for a deaf youth unable to talk, and $1678 for a youth with some other hearing impairment. Note that three times as many resources are expended per totally blind youth as are expended per deaf youth who is unable to talk.

Later in this chapter we present our benefit-cost analysis of the VR program. Our main conclusion is that the program appears to offer society a handsome return on its investment regardless of the youth's type or degree of hearing or vision handicap. We analyzed the sensitivity of benefits and costs to variations in the data and assumptions, and even with what we consider a demanding test using much more conservative assumptions than most previous evaluators have used, the program still appears to offer economic benefits to society and to taxpayers that exceed the costs for all eight categories of hearing and vision handicapped youth we analyzed. Add the enhanced quality of life of the youth served, and the VR program is all the more laudable.

Although the federal government provides over 80 percent of VR funds, along with program operating guidelines, states also play a major role because they operate the VR agencies and state personnel directly provide certain services such as counseling and placement (but contract with vendors for other services such as medical treatment and occupational training).

The federal government also supports State Employment Service agencies, which provided job information or placement services to about 11,000 hearing and vision handicapped youth in 1970, and expended about $35 per client.

Other vocational programs discussed in this chapter are the Presidential Governor's, and local Committees on Employment of the Handicapped, which primarily endeavor to educate potential employers and the public regarding the vocational abilities of the handicapped; Federal Employment of the Handicapped, a Civil Service Commission program for applicants for federal jobs; and the Randolph-Sheppard Vending Stand program, which provides visually handicapped persons with employment in governmental buildings. Exclusive of vocational education, which was discussed in Chapter 8, we estimate that all other government expenditures on vocational services for hearing and vision handicapped youth totaled $31.6 million in FY 1972.

While the vocational service programs we investigated are of clear positive value, several problems for handicapped youth were identified. They include unemployment; little program effort to combat significant underemployment; insufficient funds to meet service needs; large inequities across states in the likelihood of being
served and in expenditures per youth served; a questionable allocation of limited available VR funds favoring visually handicapped youth over hearing handicapped youth; a similarly questionable allocation for service to relatively large numbers of youth with mild visual impairments; implicit program incentives for undesirable behavior by service personnel; insufficient service personnel with special skills in helping the hearing and vision handicapped; lack of effective coordination between various vocational service programs; inadequate outreach features in the programs; and, reportedly, low quality assistance to handicapped persons by State Employment Services in general.

Recommendations for program improvement are presented in the last section of this chapter.

NEED FOR VOCATIONAL SERVICES

The relatively higher unemployment and underemployment rates among the hearing and vision handicapped, as compared with the nonhandicapped, are thought to be due to such factors as employers’ underestimation of the abilities of handicapped persons, employers’ “fear of the unknown,” the relatively lower educational levels of some handicapped groups, and the relatively longer on-the-job training period that may be required—but not to lower average mental ability and not to lower average physical ability (other than the ability to see or hear).1 Although these young persons’ abilities to perform in certain occupations are impaired, there is an abundance of other occupations in which they can be as productive as persons without sensory handicaps. Hence there is no physical or mental reason why they, as a group, cannot be as fully employed, as productive in the work force, and as well paid as their counterparts who have no sensory handicaps.

To set a perspective on the magnitude of this need, recall that there are about 50,000 profoundly deaf youth aged 0 to 21 in the United States, and another 440,000 hard of hearing youth who at least have frequent difficulty understanding normal speech (an average uncorrected hearing loss in the better ear in the speech frequency range of approximately 40 dB or more, ISO). There are also about 13,000 totally blind and 180,000 partially sighted youth who are unable to read normal newsprint (an acuity with correction in the better eye of approximately 20/70, or correspondingly significant restriction of visual field). More detailed definitions and prevalence data are presented in Appendix A of our companion report, R-1220-HEW. To get an order of magnitude estimate of the number of youth that would have to complete a vocational service program each year if all youth were to be served once, consider the number of hearing and vision handicapped youth that enter the potential client population each year. For example, dividing the number of youth aged 0 to 21 by 21 produces an estimate that each year about 2400 profoundly deaf, 21,000 hard of hearing, 600 totally blind, and 8600 partially sighted youth reach an age where they become part of the potential client population. That is, to keep up with the need on a continuing basis, the vocationally handicapped fraction of these approximately 33,000 hearing and vision handicapped youth must complete service each year. Of course, the distribution of ages of sensorially handicapped youth is not uniform from age 0 to 21, but in the absence of more reliable age-specific data, making that assumption allows us to make an order of magnitude approximation of the number of such youth entering the potential client population each year.

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In FY 1970, as detailed later in this chapter, VR case closures for deaf youth numbered 2529 (over 100 percent of the 2400 estimate just mentioned of deaf youth annually entering the client population); case closures for "other hearing impaired" youth numbered 1994 (or 9.5 percent of the 21,000 figure mentioned above); case closures for totally blind youth numbered 340 (or 57 percent of the 600 figure mentioned above); case closures for partially sighted youth, as we define them, numbered 1817 (or 21 percent of the 8600 figure mentioned above); and case closures numbered a very high 4885 for visually impaired youth who are not visually handicapped by our definitions, such as those youth with "one good eye" or "other visual impairment."2

Thus, with respect to the number in need, the VR program appears to be doing quite well in serving the most severely hearing and vision handicapped youth. It also appears to be placing relatively low emphasis on service to less severely hearing handicapped and to less severely visually handicapped youth, while placing relatively high emphasis on mildly visually impaired youth who are outside our definition of visually handicapped. Several explanations are possible for this program behavior: the mildly visually impaired youth may be more vocationally handicapped than the less severely hearing handicapped youth; the two groups may both be vocationally handicapped, but hearing handicapped youth are not as fully identified and known to the VR agency; VR counselors may be giving severely or multiply handicapped clients labels that incorrectly indicate a mild handicap, so as to lessen stigmatization; or the often-heard charge of "creaming," or accepting easy clients for service to bolster success rates, may be true for the visually impaired youth population.

The Rehabilitation Services Administration has maintained that all of these sensorially handicapped youth are vocationally handicapped and need VR services.3 If one defines need in very strict terms, such as current unemployment—ignoring potential need due to expected unemployment after school graduation and due to underemployment4—then some fraction of these youth would not need vocational services because they could find jobs without VR or employment service assistance. Service levels to meet the need clearly depend upon one's assumptions. At one extreme, all hearing and vision handicapped youth could be given full VR service in an attempt to prevent expected underemployment and unemployment. At the other extreme, only handicapped youth with at least, say, three months of unemployment would be given placement service, with none receiving VR services. A more moderate position would be that all profoundly deaf and totally blind youth

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2 While data are not available to document what constitutes "other visual impairment," our interviews with state VR personnel in California suggest that they are strabismus ("crossed eyes"), amblyopia ("lazy eye"), and relatively mild refractive errors.
3 For example, the HEW report Hearing and Speech: Obligations Fiscal Year 1970 to Fiscal Year 1974, the Rehabilitation Services Administration summary of programs for the deaf, the hard of hearing, and the speech impaired, indicates that "Americans who are vocationally handicapped by varying degrees and kinds of communication disorders exceed 20,000,000 in number" (p. 7), while the same report indicates that the prevalence of handicapping communicative disorders affects "over 20,000,000 Americans" (p. 2).
ed over 11,000 youth under age 22 with impaired hearing or vision. Of the youth accepted for VR services, 84 percent were successfully rehabilitated. Data on the fraction of young handicapped persons successfully placed by the Employment Service are not available. The total federal and state expenditures for VR and other employment services for sensorially impaired youth in FY 1972 were an estimated $31,551,000 of which the federal and state shares were 83 and 17 percent, respectively. The breakdown of the expenditures by type and degree of sensorial impairment (see Table 9.1) indicates that visually impaired youth receive nearly twice the total expenditures that hearing impaired youth receive. More expenditures go for services to the less severely handicapped youth than go to the more severely handicapped, although, as we pointed out earlier, a larger fraction of the total population of more severely handicapped youth are served.

Table 9.1
SUMMARY OF EXPENDITURES FOR VOCATIONAL SERVICES TO YOUTH, BY DISABILITY GROUP

<table>
<thead>
<tr>
<th>Type and Degree of Sensorial Impairmenta</th>
<th>Approximate Total State and Federal Expenditures on Handicap Group, FY 1972b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blind ...........................................</td>
<td>$2,524,000</td>
</tr>
<tr>
<td>Partially sighted, legally blind ........................................</td>
<td>6,526,000</td>
</tr>
<tr>
<td>Partially sighted, 20/70 up to 20/200 acuity ..................................................</td>
<td>1,609,000</td>
</tr>
<tr>
<td>One good eye .....................................</td>
<td>5,679,000</td>
</tr>
<tr>
<td>Other visual impairment .................................</td>
<td>4,259,000</td>
</tr>
<tr>
<td>Deaf, unable to talk ..................................</td>
<td>2,997,000</td>
</tr>
<tr>
<td>Other hearing impairment ..............................</td>
<td>3,176,000</td>
</tr>
<tr>
<td>Total .............................................</td>
<td>$31,551,000</td>
</tr>
</tbody>
</table>

aDefinitions of handicaps given in the U.S. Department of Health, Education and Welfare, "Statistical Reporting Procedures," Rehabilitation Services Administration Manual, Chapter 13, are grouped here as follows:
- Blind: totally blind, no light perception (code 10).
- Partially sighted—legally blind: legally but not totally blind (code 11).
- Partially sighted—20/70 up to 20/200 acuity: not legally blind, but with acuity less than 20/60 with correction in the better eye, or corresponding loss of visual field (code 12).
- One good eye: not legally blind, with acuity with correction in the better eye of 20/60 or better (code 13).
- Other visual impairment (code 14): visual impairment not covered by codes 10 to 13, and not further defined in RSA reporting instructions to the states.
- Deaf, unable to talk (code 20); deaf, able to talk (code 21), and other hearing impairments (code 22) are not further defined in the RSA reporting instructions to the states.

bAssumes total FY 1972 expenditures are distributed across handicaps in the same proportions as were the FY 1970 basic state–federal VR program expenditures.

THE CURRENT VOCATIONAL REHABILITATION PROGRAM

The present role of the federal government is dominant. It funds 80 percent of the basic VR program; supports service to all types of physically or mentally disa-
can expect vocational difficulties and will need VR services before or just after they finish school; while less severely handicapped youth—the partially sighted and hard of hearing—would need to be screened to detect the fraction who are also significantly vocationally handicapped. That fraction would need full VR services, while the remainder would need placement assistance; and only if that placement assistance were insufficient would they receive full VR services. This latter moderate position incorporates two major concepts: there is a continuum of degree of need for vocational services, and the programs should be flexible enough to assess each youth’s need and be able to respond with different levels and types of services as the youth’s need changes over time.

While the number of youth needing VR service is a matter of judgment, it is apparent from our later benefit-cost analysis that this program has humanitarian and economic benefits that exceed the cost of the program for the average youth in each category of type and degree of sensory handicap. It is also apparent that benefits would increase if the program were expanded. There is little question that, at the least, placement assistance may be needed by each sensorially handicapped youth, since these youth all have a major handicap that limits their vocational options in ways that are not fully understood by potential employers.

The parents of the handicapped youth we surveyed rated job training and placement services as less important than education, medical care, and sensory aids, but most of them had handicapped children who were not yet of working age. Three-quarters of the youth who had worked at all had had problems, and the majority of these felt their handicap was the major reason.

OVERVIEW OF CURRENT VOCATIONAL SERVICES TO HEARING AND VISION HANDICAPPED YOUTH

This section contains an overview of current programs for the provision of vocational services to hearing and vision handicapped youth. Our companion report describes the programs in detail and presents data on services to youth with all types of physical and mental handicaps. The detailed description of vocational rehabilitation of hearing and vision handicapped youth by degree of impairment appears in this chapter; the related vocational education program was discussed in Chapter 8.

The vocational services programs are designed to help handicapped persons achieve gainful employment, which may include work in the competitive labor market, self-employment, sheltered employment, homemaking, or unpaid family work. Of the estimated total of $202,254,000 federal and state expenditures in FY 1972 for vocational services to handicapped youth, 85 percent was for the VR program, which provides a wide variety of services (e.g., diagnosis, counseling, medical service, job training, placement, sensory aids) through state agencies. The remaining 15 percent was divided as follows: 6.0 percent for construction and improvement of facilities, 3.4 percent for training service personnel, 3.3 percent for research and development, 1.9 percent for Employment Services (primarily job information and placement), and 0.1 percent for Committees on Employment for the Handicapped (primarily endeavoring to educate potential employers and the public regarding the vocational abilities of the handicapped).

In 1970 we estimate that the VR and Employment Service programs each assist-

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5 See Chapter 11 for details.
bled persons with a substantial handicap to employment but with "high" vocational potential; allows provision of virtually any service that a client might need; supports research, the construction of physical plants, and the training of professional personnel; and gives special attention to the needs of low-incidence population groups such as the deaf-blind. Over time, federal assistance in VR has been a step-by-step progression in perceiving the unmet needs of disabled persons and providing otherwise unavailable funds to help meet those needs.

States also play a major role, however, because they operate the VR agencies, subject to federal guidelines. And state personnel directly provide certain services such as counseling and placement, and contract with public or private vendors for others such as medical services and vocational training.

The state-federal VR program objective is strictly vocational, to help physically and/or mentally handicapped persons to obtain gainful employment and lead meaningful lives. They may be provided "any goods and services necessary to render them fit to engage in a gainful occupation..." The handicapped person served, however, must have a "substantial handicap to employment, which is of such a nature that vocational rehabilitation services may reasonably be expected to render him fit to engage in a gainful occupation, including a gainful occupation that is more consistent with his abilities and capabilities." That is, he must need the services and have reasonable potential to benefit from them. He may also be served to evaluate his rehabilitation potential. The term "gainful occupation" is interpreted broadly to include "employment in the competitive labor market; practice of a profession; farm or family work...; sheltered employment; and home industries or other gainful homebound work."7

The federal role in rehabilitation is best characterized in terms of our Controll-ership Model because individual states are responsible for providing rehabilitation services under federal guidelines and primarily with federal funds.

The rationales sometimes advanced for the federal rehabilitation role are the provision of otherwise unavailable resources, the needed stimulation of new devices and rehabilitation techniques, and the need for a balance-wheel redressing of fiscal inequities among the states in their ability to provide services.

In the following subsections, we are able to present detailed information on services to youth with various types and degrees of sensory handicaps because the VR program maintains a much more comprehensive management information system than do any of the other major programs we analyzed. However, the latest detailed information available for research use was from FY 1970, and the data we present on persons under age 22 were computed at The Rand Corporation from "Case Service Reports," DHEW Form RSA-300, submitted on each individual applicant at time of case closure.

Rehabilitation Act of 1973 8

The Rehabilitation Act of 1973 replaces the Vocational Rehabilitation Act (29 U.S.C. 31 et seq.). The new act will revise the VR program, but will not radically change its basic aspects. The basic program will still provide grants to states, with guidelines, for provision of a wide variety of services to physically and mentally handicapped persons so that they may prepare for and engage in gainful employ-

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7 Federal Register, Vol. 34, No. 200, October 1969.
ment. Emphasis is to be placed on serving first those persons with the most severe handicap.\(^8\)

A major provision of the proposed Rehabilitation Act of 1972,\(^9\) which would have substantially enlarged program goals by removing the restriction that the rehabilitation be strictly vocationally oriented, was not adopted. Under the Rehabilitation Act of 1973, however, a study is to be conducted to develop methods of serving persons for whom a vocational goal is not feasible.

The Act also provides for one-year advanced funding; research, including several specified projects; grants for special projects and demonstrations that hold promise of expanding or otherwise improving rehabilitation services to the handicapped, including people with spinal injuries, older blind people, the deaf, migratory agricultural workers, and seasonal farm workers. The Act also provides for a National Center for Deaf-Blind Youths and Adults; grants for construction of rehabilitation facilities; mortgage insurance for rehabilitation facilities; and funds for personnel training. The Act calls for the preparation of a long-range projection for the provision of comprehensive services to the handicapped (this provision is not limited to VR programs, and the Direction Center concept discussed in Chapter 3 may be relevant). The Office of the Secretary of HEW is given responsibility for planning, evaluation, and coordination of all programs providing services to the handicapped, and for providing a central clearinghouse for information and resource availability (in effect, the creation of a national Office for the Handicapped). The Act also establishes a federal Interagency Committee on Handicapped Employees and an Architectural and Transportation Barriers Compliance Board, and forbids discrimination against the handicapped in work done under federal grants and contracts.

**Youth Caseload, FY 1970 Closures**

Of the total of 22,240 hearing or vision impaired persons aged 0 to 21 who were referred to or applied for VR services with a resultant case closure in FY 1970, 11,565 (52 percent) were accepted, and of these 9704 (84 percent) were successfully rehabilitated. As shown in Table 9.2, the success rate for persons with various types and degrees of handicaps is uniformly high; none of the eight groups we analyzed had over 23 percent failures.

States have a tendency to concentrate services on the visually handicapped: 60 percent of the sensorially impaired youth served had a vision impairment, and 66 percent of the expenditures were for that group. For comparison, in the total population of U.S. youth, there are approximately equal numbers of the more severely handicapped blind and deaf youth, and the total group of hearing handicapped youth outnumbers visually handicapped youth by about 2.5 to 1.

In terms of the number of persons served, the VR program also emphasizes service to less severely handicapped youth. For example, of all the visually handicapped youth served, only 31 percent were legally blind or had acuity with correction in their better eye worse than 20/60. However, referrals with less severe impairments are more likely to be rejected than those with the more severe impairments.

For each type of sensorial handicap, Table 9.3 shows the number of successfully

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\(^8\) As specified in the Act, the term "severe handicap" means a disability that requires multiple services over an extended period of time and results from amputation, blindness, cancer, cerebral palsy, cystic fibrosis, deafness, heart disease, hemiplegia, mental retardation, mental illness, multiple sclerosis, muscular dystrophy, neurological disorders (including stroke and epilepsy), paraplegia, quadriplegia and other spinal cord conditions, renal failure, respiratory or pulmonary dysfunction, and any other disability specified by the Secretary in regulations he shall prescribe.

\(^9\) U.S. Senate Report 92-1135.
### Table 9.2

**SUMMARY OF VOCATIONAL REHABILITATION OF YOUTH, BY DISABILITY GROUP**

<table>
<thead>
<tr>
<th>Type and Degree of Sensorial Impairment</th>
<th>Number Accepted for Service, FY 1970 Closures</th>
<th>Number Successfully Rehabilitated, FY 1970</th>
<th>Number Accepted as Percent of Number Referred, FY 1970</th>
<th>Number Rehabilitated as Percent of Number Accepted, FY 1970</th>
<th>Estimated Total State and Federal VR Expenditures on Handicap Group, FY 1972</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blind</td>
<td>340</td>
<td>263</td>
<td>57</td>
<td>77</td>
<td>$2,000,000</td>
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<tr>
<td>Partially sighted, legally blind</td>
<td>1,271</td>
<td>994</td>
<td>67</td>
<td>78</td>
<td>$5,500,000</td>
</tr>
<tr>
<td>Partially sighted, 20/70 up to 20/200 acuity</td>
<td>346</td>
<td>455</td>
<td>61</td>
<td>83</td>
<td>$1,300,000</td>
</tr>
<tr>
<td>One good eye</td>
<td>2,511</td>
<td>2172</td>
<td>68</td>
<td>87</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>Other visual impairment</td>
<td>2,374</td>
<td>2030</td>
<td>33</td>
<td>86</td>
<td>$5,600,000</td>
</tr>
<tr>
<td>Deaf, unable to talk</td>
<td>1,205</td>
<td>936</td>
<td>75</td>
<td>78</td>
<td>$2,500,000</td>
</tr>
<tr>
<td>Deaf, able to talk</td>
<td>1,324</td>
<td>1126</td>
<td>66</td>
<td>85</td>
<td>$2,800,000</td>
</tr>
<tr>
<td>Other hearing impairment</td>
<td>1,994</td>
<td>1728</td>
<td>46</td>
<td>87</td>
<td>$3,700,000</td>
</tr>
<tr>
<td>Total</td>
<td>11,565</td>
<td>9704</td>
<td>52</td>
<td>84</td>
<td>$26,100,000</td>
</tr>
</tbody>
</table>

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*Data presented on persons under age 22 have been computed at The Rand Corporation from FY 1970 "Case Service Reports," DHHS form RSA-300, submitted on each individual applicant at the time of case closure.*

* Assumes total FY 1972 expenditures are distributed across handicaps in the same proportions as were the FY 1970 basic state-federal VR program expenditures.*
Table 9.3
SUCCESSFULLY REHABILITATED YOUTH PER 100,000 POPULATION: VARIOUS HANDICAP GROUPS BY STATE, FY 1970$^a$

<table>
<thead>
<tr>
<th>U.S. Figures/State Figures$^b$</th>
<th>Partially Sighted—Legally Blind</th>
<th>Partially Sighted—20/70 up to 20/200 Acuity</th>
<th>One Good Eye</th>
<th>Other Visual Impairment</th>
<th>Deaf, Unable To Talk</th>
<th>Deaf, Able To Talk</th>
<th>Other Hearing Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate per 100,000 population age</td>
<td></td>
<td></td>
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<td>14-21 in U.S.</td>
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<td>3</td>
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</tr>
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<td>Connecticut</td>
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<td>8</td>
<td>4</td>
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<tr>
<td>D.C.</td>
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</tr>
<tr>
<td>Florida</td>
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<td>1</td>
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<td>Illinois</td>
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<td>6</td>
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<tr>
<td>Indiana</td>
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<td>1</td>
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<tr>
<td>Iowa$^c$</td>
<td>0.4</td>
<td>3</td>
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<td>Louisiana$^c$</td>
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<td>Maine</td>
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<td>4</td>
<td>4</td>
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<td>Maryland</td>
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<td>1.4</td>
<td>3</td>
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<td></td>
<td></td>
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<tr>
<td>Minnesota$^c$</td>
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<td>3</td>
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<td>0.8</td>
<td>3</td>
<td>4</td>
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<tr>
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<td>0</td>
<td>2</td>
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<td>New Hampshire$^c$</td>
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<td>2</td>
<td>13</td>
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</tr>
<tr>
<td>New Jersey</td>
<td>(d)</td>
<td>(d)</td>
<td>(d)</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>New Mexico$^c$</td>
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<td>5</td>
<td>2</td>
<td></td>
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<tr>
<td>New York$^c$</td>
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<td>2</td>
<td>1</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>North Carolina$^c$</td>
<td>0.6</td>
<td>3</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Dakota$^c$</td>
<td>1.0</td>
<td>3</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ohio$^c$</td>
<td>0.6</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oklahoma</td>
<td>0.8</td>
<td>3</td>
<td>18</td>
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<tr>
<td>Oregon$^c$</td>
<td>0.6</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pennsylvania$^c$</td>
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<td>3</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhode Island$^c$</td>
<td>1.4</td>
<td>4</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>South Carolina$^c$</td>
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<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Dakota$^c$</td>
<td>0.9</td>
<td>3</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennessee$^c$</td>
<td>0.2</td>
<td>5</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texas$^c$</td>
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<td>3</td>
<td>10</td>
<td></td>
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</tr>
<tr>
<td>Vermont$^c$</td>
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<td>3</td>
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</tr>
<tr>
<td>Virginia$^a$</td>
<td>0.4</td>
<td>3</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washington$^c$</td>
<td>0.4</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Virginia$^c$</td>
<td>1.1</td>
<td>6</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wisconsin$^c$</td>
<td>0.9</td>
<td>3</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wyoming$^d$</td>
<td>0.0</td>
<td>0</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^a$SOURCE: Rand analysis of FY 1970 "Case Service Reports."

$^b$State figures are rate per 100,000 population aged 14 to 21.

$^c$In 1970, state had a separate VR agency for the visually handicapped, in addition to one for all other handicaps combined.

$^d$Not available.
rehabilitated youth per 100,000 population aged 14 to 21 in each state. The average 1970 success rates were 19 and 12 per 100,000 persons aged 14 to 21 in the United States, for vision and hearing handicapped youth, respectively, but there was extreme variation across the states. For example, the number of totally blind youth rehabilitated per 100,000 ranged from less than 0.1 to a high of 2.2 across the states; the numbers of youth with one good eye that were rehabilitated ranged from 0 to 24 per 100,000; the numbers for deaf youth unable to talk ranged from less than 1 to 9 per 100,000; and the numbers for other hearing impaired youth ranged from less than 1 to 17 per 100,000 across the states. The chances of being accepted for service also vary extremely across the states; the chances vary much more than incidence rates of the handicapping conditions can reasonably be expected to vary.

The choice of what type and severity of a person’s handicap will permit acceptance into the program is up to the states within very broad federal guidelines—in some cases in a virtual absence of federal definition of what constitutes the handicap. Consequently, some states serve relatively large numbers of sensorially impaired youth, some serve very few, some emphasize service to the severely impaired, and some emphasize service to the less severely impaired while serving relatively few of the more severely impaired. The relatively high emphasis on service to the mildly visually impaired is clear.

We also addressed the question of whether a visually impaired youth is more likely to be served and rehabilitated in a state with a separate agency for VR service to the visually handicapped. Surprisingly, the average number of rehabilitations per 100,00 youth aged 14 to 21 in the state’s population was higher for blind and other visually impaired youth in states without a special VR agency for the visually handicapped, and was approximately the same for the other three categories of visual handicap. Thus, the state VR agencies for the visually handicapped serve relatively fewer of the most mildly handicapped youth, but also serve relatively fewer of the most severely handicapped youth. So at least for youth, states with special VR agencies for the visually handicapped do not provide clearly better results in terms of the number of rehabilitations per 100,000 population. However, states with special VR agencies for the visually handicapped spend more per visually handicapped youth rehabilitated than the average of the 50 states—from a maximum of 35 percent more for totally blind youth to a minimum of 5 percent more for youth with one good eye.

Characteristics of The Recipients

Age. Nearly all young rehabilitants were over age 14. Understandably, the heaviest concentration was in the 16 to 19 age group. The totally blind are served at a slightly younger age than the other handicap groups, as shown in Table 9.4.

Education. Slightly over half the rehabilitants in each handicap group had completed high school. However, of deaf youth who were unable to talk, 42 percent were high school graduates. Approximately 20 percent of the total had completed the 9th grade or less, although (as shown in Table 9.5) that figure was 29 percent for the deaf who were unable to talk.

Secondary Sensorial Disabilities. In addition to youth primarily hearing or vision disabled, less than 1 percent of all young VR clients are reported to have secondary vision or hearing disabilities. As shown in Table 9.6, most reported secondary sensorial disabilities were the less severe types of visual or hearing impairment. Since VR personnel have no strong incentives to report secondary disabilities, they may be underreported.
Table 9.4
PERCENTAGE OF VR REHABILITANTS BY AGE GROUP, FY 1970 CLOSURES

<table>
<thead>
<tr>
<th>Type and Degree of Sensorial Handicap</th>
<th>Age Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-13</td>
</tr>
<tr>
<td>Blind</td>
<td>1.2</td>
</tr>
<tr>
<td>Partially sighted—legally blind</td>
<td>2.9</td>
</tr>
<tr>
<td>Partially sighted—20/70 up to 20/200 acuity</td>
<td>0.8</td>
</tr>
<tr>
<td>One good eye</td>
<td>1.4</td>
</tr>
<tr>
<td>Other visual impairment</td>
<td>1.7</td>
</tr>
<tr>
<td>Deaf, unable to talk</td>
<td>1.4</td>
</tr>
<tr>
<td>Deaf, able to talk</td>
<td>1.6</td>
</tr>
<tr>
<td>Other hearing impairment</td>
<td>2.0</td>
</tr>
</tbody>
</table>

SOURCE: Rand analysis of FY 1970 "Case Service Reports."

Table 9.5
PERCENTAGE OF YOUNG REHABILITANTS BY EDUCATIONAL LEVEL, FY 1970 CLOSURES

<table>
<thead>
<tr>
<th>Highest Grade Completed</th>
<th>Partially Sighted: Legally Blind</th>
<th>Partially Sighted: 20/70 up to 20/200 Acuity</th>
<th>One Good Eye</th>
<th>Other Visual Impairment</th>
<th>Deaf, Unable To Talk</th>
<th>Deaf, Able To Talk</th>
<th>Other Hearing Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6</td>
<td>5.9</td>
<td>5.5</td>
<td>2.4</td>
<td>1.0</td>
<td>2.2</td>
<td>10.7</td>
<td>5.8</td>
</tr>
<tr>
<td>7-9</td>
<td>16.8</td>
<td>18.0</td>
<td>11.0</td>
<td>9.6</td>
<td>14.6</td>
<td>18.5</td>
<td>14.4</td>
</tr>
<tr>
<td>10-11</td>
<td>25.0</td>
<td>25.4</td>
<td>27.4</td>
<td>26.2</td>
<td>27.8</td>
<td>29.0</td>
<td>27.2</td>
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<td>42.7</td>
<td>31.6</td>
<td>56.4</td>
<td>49.5</td>
<td>39.1</td>
<td>47.6</td>
</tr>
<tr>
<td>13-20</td>
<td>10.8</td>
<td>8.5</td>
<td>7.5</td>
<td>8.8</td>
<td>5.9</td>
<td>2.7</td>
<td>4.9</td>
</tr>
</tbody>
</table>

SOURCE: Rand analysis of FY 1970 "Case Service Reports."

Table 9.6
NUMBER AND PERCENTAGE OF YOUNG VR CLIENTS WITH SECONDARY DISABILITIES, FY 1970 CLOSURES

<table>
<thead>
<tr>
<th>Type and Degree of Secondary Disability</th>
<th>Not Rehabilitated</th>
<th>Rehabilitated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number(^a)</td>
<td>Percent(^b)</td>
</tr>
<tr>
<td>Blind</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Partially sighted—legally blind</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Partially sighted—20/70 up to 20/200 acuity</td>
<td>6</td>
<td>0.0</td>
</tr>
<tr>
<td>One good eye</td>
<td>24</td>
<td>0.1</td>
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<tr>
<td>Other visual impairment</td>
<td>93</td>
<td>0.4</td>
</tr>
<tr>
<td>Total, visual impairment</td>
<td>123</td>
<td>0.5</td>
</tr>
<tr>
<td>Deaf, unable to talk</td>
<td>7</td>
<td>0.0</td>
</tr>
<tr>
<td>Deaf, able to talk</td>
<td>11</td>
<td>0.0</td>
</tr>
<tr>
<td>Other hearing impairment</td>
<td>30</td>
<td>0.1</td>
</tr>
<tr>
<td>Total, hearing impairment</td>
<td>48</td>
<td>0.2</td>
</tr>
<tr>
<td>Total, both impairments</td>
<td>171</td>
<td>0.7(^c)</td>
</tr>
</tbody>
</table>

\(^a\)SOURCE: Rand analysis of FY 1970 "Case Service Reports."

\(^b\)Number as a percentage of FY 1970 closure clients with any type of primary disability.

\(^c\)Column does not total exactly due to rounding.
Referrals

Schools are the largest single source of referrals to the VR program, sending between one-third and three-fourths of the applicants, depending on the type and degree of sensorial impairment (see Table 9.7). Medical sources are responsible for less than 15 percent of the referrals, while approximately 20 percent of the youth are self-referred or referred by a person not connected with the public or private service system for the handicapped. Problems noted are the poor coordination between VR and the schools and a deficiency in VR outreach efforts. Two prime recommendations for handicapped children by a National Citizens Advisory Committee on Vocational Rehabilitation were aimed at alleviating these problems.11 Some progress in coordination has been noted in recent years, at least at the agency administration level.12

Only a small fraction of those not accepted for service are reported as being referred elsewhere by VR personnel (5 percent for all handicaps combined). This again stresses a need for direction, as discussed in Chapter 3.

Outcomes of Referrals to VR Agencies

Approximately half of the sensorially handicapped youth referred for VR services are not accepted; the rejection rate varies from 25 percent of deaf applicants who are unable to talk to more than 65 percent of those classified as having “other visual impairment” (see Table 9.8). Of those accepted for service, 84 percent are successfully rehabilitated; the lowest success rate reported, 73 percent, was for totally blind youth served by VR agencies that accept persons with all types of handicaps.

Despite the existence of a special VR agency for the visually handicapped in a majority of the states, only about one-quarter of the visually handicapped youth served by VR are served by VR agencies for the visually handicapped exclusively. The overall rejection and success rates for VR agencies for the visually handicapped are approximately the same as those for VR agencies serving persons with all types of handicaps; however, agencies serving only the visually handicapped tended to reject a lower percentage of the severely impaired, and a higher percentage of the mildly impaired.

The main reasons sensorially impaired youth were not accepted for VR services were: the youth refused services or failed to cooperate (35 percent of those not accepted); the youth could not be located or contacted, or had moved (12 percent); the youth was not handicapped or not vocationally handicapped (37 percent). Only 2 percent were reported as unserved because their handicap was too severe or because of an unfavorable medical prognosis. The mildly impaired were most often rejected because of the lack of a physical or vocational handicap, while the most severely impaired were most often not accepted because they were “missing persons,” i.e., they reportedly could not be located or contacted, or had moved (see Table

11 Report of the National Citizens Advisory Committee on Vocational Rehabilitation, submitted to the Secretary of Health, Education and Welfare, June 26, 1968, p. 2. Recommendations for handicapped children included “Establishment of cooperative school-rehabilitation programs in all schools, public and private, in both urban and rural locations, including a central repository of health and rehabilitation records,” and “Evaluations of disabled children for rehabilitation purposes by vocational rehabilitation personnel at regular intervals ... to help prepare the child for a meaningful adult vocational career.”

12 See, for example, M. S. Hester, Director-in-Charge, Workshop on Evaluation and Recommendations Relating to the National Conference for Coordinating Vocational Rehabilitation and Educational Services for Deaf People, Delgado College, New Orleans, Louisiana, February 12-13, 1971, HEW Publication No. (SRS) 72-25030.
Table 9.7

SOURCES OF YOUTH REFERRAL TO STATE VR AGENCIES, BY HANDICAP, AND REFERRAL OUTCOMES, FY 1970 CLOSURES
(In percent)

<table>
<thead>
<tr>
<th>Referral Source</th>
<th>Blind</th>
<th>Partially Sighted</th>
<th>Partially Sighted: 20/70 up to 20/200 Acuity</th>
<th>One Good Eye</th>
<th>Other Visual Impairment</th>
<th>Deaf, Unable to Talk</th>
<th>Deaf, Able to Talk</th>
<th>Other Hearing Impairment</th>
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<tbody>
<tr>
<td></td>
<td>Not Accepted</td>
<td>Rehabilitated</td>
<td>Not Accepted</td>
<td>Rehabilitated</td>
<td>Not Accepted</td>
<td>Rehabilitated</td>
<td>Not Accepted</td>
<td>Rehabilitated</td>
</tr>
<tr>
<td>Educational institutions</td>
<td>12.7</td>
<td>16.8</td>
<td>17.1</td>
<td>15.8</td>
<td>33.1</td>
<td>38.6</td>
<td>32.2</td>
<td>45.0</td>
</tr>
<tr>
<td>Elementary or high school</td>
<td>16.3</td>
<td>22.4</td>
<td>10.5</td>
<td>14.7</td>
<td>0.9</td>
<td>3.3</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>School for handicapped</td>
<td>4.3</td>
<td>2.8</td>
<td>4.2</td>
<td>5.5</td>
<td>1.6</td>
<td>5.7</td>
<td>3.0</td>
<td>4.7</td>
</tr>
<tr>
<td>Other educational institutions</td>
<td>5.3</td>
<td>2.8</td>
<td>1.7</td>
<td>1.4</td>
<td>0.9</td>
<td>2.0</td>
<td>0.8</td>
<td>1.6</td>
</tr>
<tr>
<td>Hospitals and sanitariums</td>
<td>8.7</td>
<td>6.8</td>
<td>8.6</td>
<td>6.2</td>
<td>3.0</td>
<td>5.6</td>
<td>2.9</td>
<td>2.5</td>
</tr>
<tr>
<td>Health organizations and agencies</td>
<td>7.4</td>
<td>12.0</td>
<td>11.9</td>
<td>11.9</td>
<td>7.7</td>
<td>7.7</td>
<td>8.4</td>
<td>3.4</td>
</tr>
<tr>
<td>Welfare agencies</td>
<td>7.4</td>
<td>12.0</td>
<td>11.9</td>
<td>11.9</td>
<td>7.7</td>
<td>7.7</td>
<td>8.4</td>
<td>3.4</td>
</tr>
<tr>
<td>Other public organizations and agencies</td>
<td>0.4</td>
<td>0.4</td>
<td>0.0</td>
<td>0.6</td>
<td>0.6</td>
<td>0.5</td>
<td>1.3</td>
<td>1.0</td>
</tr>
<tr>
<td>Correctional or court agency</td>
<td>2.9</td>
<td>1.6</td>
<td>3.4</td>
<td>1.3</td>
<td>8.4</td>
<td>5.9</td>
<td>9.6</td>
<td>6.3</td>
</tr>
<tr>
<td>Employment service</td>
<td>19.2</td>
<td>10.8</td>
<td>20.3</td>
<td>25.5</td>
<td>17.9</td>
<td>8.2</td>
<td>17.3</td>
<td>7.6</td>
</tr>
<tr>
<td>Other public</td>
<td>9.8</td>
<td>2.8</td>
<td>5.5</td>
<td>1.7</td>
<td>1.8</td>
<td>0.6</td>
<td>1.2</td>
<td>0.8</td>
</tr>
<tr>
<td>Individuals</td>
<td>9.5</td>
<td>10.8</td>
<td>10.5</td>
<td>12.8</td>
<td>7.7</td>
<td>7.5</td>
<td>7.9</td>
<td>9.7</td>
</tr>
<tr>
<td>Self-referred person</td>
<td>2.9</td>
<td>1.6</td>
<td>3.5</td>
<td>3.3</td>
<td>4.0</td>
<td>3.1</td>
<td>2.1</td>
<td>4.4</td>
</tr>
<tr>
<td>Physician</td>
<td>13.3</td>
<td>8.4</td>
<td>12.1</td>
<td>8.7</td>
<td>10.2</td>
<td>11.5</td>
<td>12.7</td>
<td>12.7</td>
</tr>
<tr>
<td>Other individual</td>
<td>100.0</td>
<td>100.0</td>
<td>99.9</td>
<td>99.8</td>
<td>99.5</td>
<td>99.4</td>
<td>99.7</td>
<td>99.9</td>
</tr>
</tbody>
</table>

SOURCE: Rand analysis of FY 1970 "Case Service Reports."

NOTE: Columns may not total exactly due to rounding.
Table 9.8

REFERRAL OUTCOMES BY TYPE OF VR AGENCY

<table>
<thead>
<tr>
<th>Type and Degree of Sensory Handicap</th>
<th>VR Agencies for the Visually Handicapped Only</th>
<th>VR Agencies Serving Persons with All Types of Handicaps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blind</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Partially sighted--legally blind</td>
<td>140</td>
<td>42</td>
</tr>
<tr>
<td>Partially sighted--20/70 up to 20/200 acuity</td>
<td>403</td>
<td>31</td>
</tr>
<tr>
<td>One good eye</td>
<td>85</td>
<td>36</td>
</tr>
<tr>
<td>Other visual impairment</td>
<td>254</td>
<td>40</td>
</tr>
<tr>
<td>Deaf, unable to talk</td>
<td>1047</td>
<td>77</td>
</tr>
<tr>
<td>Deaf, able to talk</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>Other hearing impairment</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>All handicaps combined</td>
<td>1934</td>
<td>50</td>
</tr>
</tbody>
</table>

SOURCE: Rand analysis of FY 1970 "Case Service Reports."

9.9. The reasons given on the reporting forms are not nearly as informative as they might be (e.g., why did one-quarter of those not served "refuse" services?).

The prime reason for hearing and vision impaired youth not being successfully rehabilitated after they are accepted is that they "drop out," i.e., as shown in Tables 9.10 and 9.11, fully one-third either could not be located or contacted, or had moved. Another 20 percent refused service, and 12 percent "failed to cooperate." Again, these "reasons" are not very informative. The severity of the handicap was cited as the primary reason for only 6 percent of the nonrehabilitations of all sensorially impaired youth, and for less than one-fourth of those most severely impaired. Also, nearly half of those cases closed as "not rehabilitated" are closed after acceptance of the client and preparation of a plan for rehabilitation services, but before the services specified in the plan begin.

Table 9.9

REASONS YOUTH WERE NOT SERVED IN VR PROGRAM
(In percent)

<table>
<thead>
<tr>
<th>Type and Degree of Sensory Handicap</th>
<th>Unable to Locate or Contact, Moved</th>
<th>Handicap Too Severe or Refused Services</th>
<th>Medical Prognosis</th>
<th>Youth Refused</th>
<th>Youth Institutionalized</th>
<th>Transfer to Another Agency</th>
<th>Failure to Cooperate</th>
<th>No Handicap</th>
<th>No Vocational Handicap</th>
<th>Other Reason Not Given</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blind</td>
<td>21</td>
<td>9</td>
<td>15</td>
<td>6</td>
<td>2</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>Partially sighted--legally blind</td>
<td>22</td>
<td>12</td>
<td>17</td>
<td>2</td>
<td>1</td>
<td>12</td>
<td>8</td>
<td>11</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Partially sighted--20/70 up to 20/200 acuity</td>
<td>14</td>
<td>1</td>
<td>20</td>
<td>1</td>
<td>0</td>
<td>8</td>
<td>16</td>
<td>13</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>One good eye</td>
<td>17</td>
<td>2</td>
<td>32</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>17</td>
<td>9</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Other visual impairment</td>
<td>9</td>
<td>3</td>
<td>22</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>9</td>
<td>30</td>
<td>18</td>
<td>8</td>
</tr>
<tr>
<td>Deaf, unable to talk</td>
<td>3</td>
<td>3</td>
<td>30</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>12</td>
<td>2</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>Deaf, able to talk</td>
<td>15</td>
<td>3</td>
<td>22</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>16</td>
<td>20</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>Other hearing impairment</td>
<td>10</td>
<td>1</td>
<td>28</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>11</td>
<td>18</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>All handicaps combined</td>
<td>12</td>
<td>2</td>
<td>24</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>11</td>
<td>22</td>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>

SOURCE: Rand analysis of FY 1970 "Case Service Reports."
Table 9.10
REASONS YOUTH WERE NOT REHABILITATED IN THE VR PROGRAM
(In percent)

<table>
<thead>
<tr>
<th>Type and Degree of Sensorial Handicap</th>
<th>Unable to Locate or Contact, Moved</th>
<th>Handicap Too Severe or Unfavorable Medical Prognosis</th>
<th>Youth Refused Services</th>
<th>Death</th>
<th>Youth Institutionalized</th>
<th>Transfer to Another Agency</th>
<th>Failure to Cooperate</th>
<th>Other or Reason Not Given</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blind</td>
<td>22.0</td>
<td>22.1</td>
<td>11.7</td>
<td>5.2</td>
<td>3.9</td>
<td>7.8</td>
<td>10.4</td>
<td>18.2</td>
</tr>
<tr>
<td>Partially sighted—legally blind</td>
<td>26.6</td>
<td>11.9</td>
<td>22.3</td>
<td>6.5</td>
<td>2.8</td>
<td>6.6</td>
<td>10.2</td>
<td>13.3</td>
</tr>
<tr>
<td>Partially sighted—20/70 up to 20/200 acuity</td>
<td>31.8</td>
<td>6.6</td>
<td>16.5</td>
<td>5.5</td>
<td>0.0</td>
<td>14.1</td>
<td>8.7</td>
<td>16.4</td>
</tr>
<tr>
<td>One good eye</td>
<td>36.3</td>
<td>2.4</td>
<td>23.9</td>
<td>2.1</td>
<td>2.7</td>
<td>5.1</td>
<td>15.8</td>
<td>12.1</td>
</tr>
<tr>
<td>Other visual impairment</td>
<td>36.8</td>
<td>2.4</td>
<td>24.2</td>
<td>2.6</td>
<td>0.9</td>
<td>6.4</td>
<td>10.2</td>
<td>16.9</td>
</tr>
<tr>
<td>Deaf, unable to talk</td>
<td>35.5</td>
<td>8.9</td>
<td>13.7</td>
<td>2.4</td>
<td>1.6</td>
<td>2.8</td>
<td>10.3</td>
<td>24.2</td>
</tr>
<tr>
<td>Deaf, able to talk</td>
<td>36.7</td>
<td>5.0</td>
<td>20.2</td>
<td>2.0</td>
<td>2.0</td>
<td>4.5</td>
<td>11.1</td>
<td>18.6</td>
</tr>
<tr>
<td>Other hearing impairment</td>
<td>33.8</td>
<td>3.4</td>
<td>22.9</td>
<td>3.8</td>
<td>3.0</td>
<td>0.0</td>
<td>13.9</td>
<td>17.0</td>
</tr>
<tr>
<td>All handicaps combined</td>
<td>33.8</td>
<td>6.1</td>
<td>20.7</td>
<td>3.4</td>
<td>2.2</td>
<td>5.0</td>
<td>12.1</td>
<td>16.7</td>
</tr>
</tbody>
</table>

SOURCE: Rand analysis of FY 1970 "Case Service Reports."

Previous VR Service

About 4 percent of young hearing or vision impaired clients whose cases were closed in FY 1970 were repeat clients who had received VR services and had another case closure prior to FY 1970, and the majority of them had been successfully rehabilitated previously. Deaf youth unable to talk made up the highest fraction (7 percent) with previous case closure. (See Table 9.12).

Earnings and Sources of Support

Family and friends were the primary source of support for 81 percent of the rehabilitants at time of referral; an additional 12 percent were self-supporting from current earnings, interest, dividends, or rental income. Only 3 percent listed welfare as the primary source of support, but the comparable figure was 9 percent for the legally blind. (See Table 9.13.)

The median annual family income of rehabilitants at time of referral is approximately $4500, i.e., half of the families have income less than that amount. Seventeen percent of the families have annual incomes under $1800, and 21 percent receive over $7200 per year. (See Table 9.14.)

Although only 3 percent of the young hearing or vision handicapped rehabilitants listed welfare as their primary source of support at the time of referral, 8 percent received some type of public assistance. As shown in Table 9.15, the type most frequently received in 1970 was Aid to the Blind. At the time of closure, only 3 percent received public assistance.

For successfully rehabilitated hearing and vision impaired youth in FY 1970, only 14 percent were "gainfully employed" at the time of referral, in contrast to 100 percent at time of closure. (See Table 9.16.) At time of referral, over half were nonworking students; at time of closure, 86 percent were in the competitive labor market, 8 percent were homemakers, and 3 percent were employed in sheltered workshops. The difference in work status by type and degree of handicap is most notable for the legally blind; 15 percent were in sheltered workshops at time of
Table 9.11
REASONS YOUTH WERE NOT REHABILITATED IN THE VR PROGRAM, BY TIME OF CLOSURE
(In percent)

<table>
<thead>
<tr>
<th>Type and Degree of Sensorial Handicap</th>
<th>Unable to Locate or Contact, Moved</th>
<th>Handicap Too Severe or Unfavorable Medical Prognosis</th>
<th>Youth Refused Services</th>
<th>Death</th>
<th>Youth Institutionalized</th>
<th>Transfer to Another Agency</th>
<th>Failure to Cooperate</th>
<th>Other or Reason Not Given</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blind</td>
<td>1.3</td>
<td>9.1</td>
<td>1.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>1.3</td>
<td>3.9</td>
<td>16.9</td>
</tr>
<tr>
<td>Partially sighted—legally blind</td>
<td>0.7</td>
<td>4.7</td>
<td>2.9</td>
<td>1.1</td>
<td>0.0</td>
<td>0.0</td>
<td>2.2</td>
<td>2.9</td>
<td>14.5</td>
</tr>
<tr>
<td>Partially sighted—20/70 up to 20/200 acuity</td>
<td>0.0</td>
<td>1.1</td>
<td>1.1</td>
<td>0.0</td>
<td>0.0</td>
<td>1.1</td>
<td>0.0</td>
<td>1.1</td>
<td>4.4</td>
</tr>
<tr>
<td>One good eye</td>
<td>0.3</td>
<td>0.6</td>
<td>0.9</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Other visual impairment</td>
<td>0.6</td>
<td>0.8</td>
<td>1.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.3</td>
<td>0.6</td>
<td>1.0</td>
<td>3.8</td>
</tr>
<tr>
<td>Deaf, unable to talk</td>
<td>0.4</td>
<td>3.3</td>
<td>0.7</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>1.1</td>
<td>0.2</td>
<td>6.3</td>
</tr>
<tr>
<td>Deaf, able to talk</td>
<td>2.0</td>
<td>1.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.5</td>
<td>0.5</td>
<td>1.5</td>
<td>6.0</td>
</tr>
<tr>
<td>Other hearing impairment</td>
<td>0.0</td>
<td>1.1</td>
<td>1.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>2.3</td>
<td>0.8</td>
<td>5.3</td>
</tr>
<tr>
<td>All handicaps combined</td>
<td>0.6</td>
<td>2.1</td>
<td>1.1</td>
<td>0.2</td>
<td>0.1</td>
<td>0.2</td>
<td>1.0</td>
<td>1.1</td>
<td>6.2</td>
</tr>
</tbody>
</table>

Closure from Extended Evaluation Status

<table>
<thead>
<tr>
<th>Type and Degree of Sensorial Handicap</th>
<th>Unable to Locate or Contact, Moved</th>
<th>Handicap Too Severe or Unfavorable Medical Prognosis</th>
<th>Youth Refused Services</th>
<th>Death</th>
<th>Youth Institutionalized</th>
<th>Transfer to Another Agency</th>
<th>Failure to Cooperate</th>
<th>Other or Reason Not Given</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blind</td>
<td>3.9</td>
<td>3.9</td>
<td>6.5</td>
<td>1.3</td>
<td>2.6</td>
<td>1.3</td>
<td>0.0</td>
<td>2.6</td>
<td>22.1</td>
</tr>
<tr>
<td>Partially sighted—legally blind</td>
<td>8.6</td>
<td>2.5</td>
<td>11.5</td>
<td>1.5</td>
<td>0.7</td>
<td>1.5</td>
<td>3.3</td>
<td>4.0</td>
<td>33.6</td>
</tr>
<tr>
<td>Partially sighted—20/70 up to 20/200 acuity</td>
<td>9.8</td>
<td>1.1</td>
<td>8.8</td>
<td>1.1</td>
<td>0.0</td>
<td>5.4</td>
<td>3.3</td>
<td>6.6</td>
<td>36.1</td>
</tr>
<tr>
<td>One good eye</td>
<td>17.1</td>
<td>0.9</td>
<td>14.7</td>
<td>0.6</td>
<td>1.2</td>
<td>2.7</td>
<td>7.1</td>
<td>8.0</td>
<td>52.3</td>
</tr>
<tr>
<td>Other visual impairment</td>
<td>11.3</td>
<td>0.9</td>
<td>13.9</td>
<td>0.0</td>
<td>0.0</td>
<td>2.3</td>
<td>3.8</td>
<td>8.7</td>
<td>40.9</td>
</tr>
<tr>
<td>Deaf, unable to talk</td>
<td>13.7</td>
<td>1.9</td>
<td>8.5</td>
<td>0.7</td>
<td>0.7</td>
<td>0.4</td>
<td>3.0</td>
<td>18.4</td>
<td>47.3</td>
</tr>
<tr>
<td>Deaf, able to talk</td>
<td>11.6</td>
<td>0.5</td>
<td>11.6</td>
<td>0.0</td>
<td>1.0</td>
<td>1.0</td>
<td>6.6</td>
<td>10.6</td>
<td>43.0</td>
</tr>
<tr>
<td>Other hearing impairment</td>
<td>13.1</td>
<td>0.8</td>
<td>16.1</td>
<td>0.8</td>
<td>0.4</td>
<td>0.0</td>
<td>6.4</td>
<td>11.3</td>
<td>48.9</td>
</tr>
<tr>
<td>All handicaps combined</td>
<td>12.3</td>
<td>1.3</td>
<td>12.4</td>
<td>0.7</td>
<td>0.7</td>
<td>1.6</td>
<td>4.7</td>
<td>9.4</td>
<td>43.1</td>
</tr>
</tbody>
</table>

Closure Before Rehabilitation Services Began

<table>
<thead>
<tr>
<th>Type and Degree of Sensorial Handicap</th>
<th>Unable to Locate or Contact, Moved</th>
<th>Handicap Too Severe or Unfavorable Medical Prognosis</th>
<th>Youth Refused Services</th>
<th>Death</th>
<th>Youth Institutionalized</th>
<th>Transfer to Another Agency</th>
<th>Failure to Cooperate</th>
<th>Other or Reason Not Given</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blind</td>
<td>16.8</td>
<td>9.1</td>
<td>3.9</td>
<td>2.6</td>
<td>1.3</td>
<td>6.5</td>
<td>9.1</td>
<td>11.7</td>
<td>61.0</td>
</tr>
<tr>
<td>Partially sighted—legally blind</td>
<td>17.3</td>
<td>4.7</td>
<td>7.9</td>
<td>3.9</td>
<td>2.1</td>
<td>5.1</td>
<td>4.7</td>
<td>6.4</td>
<td>52.1</td>
</tr>
<tr>
<td>Partially sighted—20/70 up to 20/200 acuity</td>
<td>22.0</td>
<td>4.4</td>
<td>6.6</td>
<td>4.4</td>
<td>0.0</td>
<td>7.6</td>
<td>5.4</td>
<td>8.7</td>
<td>59.1</td>
</tr>
<tr>
<td>One good eye</td>
<td>18.9</td>
<td>0.9</td>
<td>8.3</td>
<td>1.5</td>
<td>1.5</td>
<td>2.4</td>
<td>8.8</td>
<td>41.1</td>
<td>46.4</td>
</tr>
<tr>
<td>Other visual impairment</td>
<td>24.9</td>
<td>1.2</td>
<td>9.3</td>
<td>2.6</td>
<td>0.9</td>
<td>3.8</td>
<td>5.8</td>
<td>7.2</td>
<td>55.7</td>
</tr>
<tr>
<td>Deaf, unable to talk</td>
<td>21.4</td>
<td>3.7</td>
<td>4.5</td>
<td>1.5</td>
<td>0.7</td>
<td>2.2</td>
<td>6.2</td>
<td>5.6</td>
<td>45.8</td>
</tr>
<tr>
<td>Deaf, able to talk</td>
<td>23.1</td>
<td>3.0</td>
<td>8.6</td>
<td>2.0</td>
<td>1.0</td>
<td>3.0</td>
<td>4.0</td>
<td>6.5</td>
<td>51.2</td>
</tr>
<tr>
<td>Other hearing impairment</td>
<td>20.7</td>
<td>1.5</td>
<td>5.7</td>
<td>3.0</td>
<td>2.6</td>
<td>0.0</td>
<td>7.2</td>
<td>4.9</td>
<td>45.6</td>
</tr>
<tr>
<td>All handicaps combined</td>
<td>20.9</td>
<td>2.7</td>
<td>1.2</td>
<td>2.5</td>
<td>1.4</td>
<td>3.2</td>
<td>6.4</td>
<td>6.2</td>
<td>50.5</td>
</tr>
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</table>

SOURCE: Rand analysis of FY 1970 "Case Service Reports."
**Table 9.12**

PERCENTAGE OF VR YOUTH CLIENTS WITH PREVIOUS CASE CLOSURES

<table>
<thead>
<tr>
<th>Type and Degree of Sensory Handicap</th>
<th>Percent Previously &quot;Rehabilitated&quot;</th>
<th>Percent Previously &quot;Not Rehabilitated&quot;</th>
<th>Percent Not Previously Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blind</td>
<td>3.1</td>
<td>1.4</td>
<td>95.5</td>
</tr>
<tr>
<td>Partially sighted—legally blind</td>
<td>5.2</td>
<td>1.3</td>
<td>93.5</td>
</tr>
<tr>
<td>Partially sighted—20/70 up to 20/200 acuity</td>
<td>3.8</td>
<td>1.9</td>
<td>96.3</td>
</tr>
<tr>
<td>One good eye</td>
<td>1.8</td>
<td>1.4</td>
<td>98.8</td>
</tr>
<tr>
<td>Other visual impairment</td>
<td>1.9</td>
<td>0.8</td>
<td>97.3</td>
</tr>
<tr>
<td>Deaf, unable to talk</td>
<td>3.2</td>
<td>2.7</td>
<td>93.8</td>
</tr>
<tr>
<td>Deaf, able to talk</td>
<td>3.5</td>
<td>2.7</td>
<td>93.8</td>
</tr>
<tr>
<td>Other hearing impairment</td>
<td>3.2</td>
<td>1.3</td>
<td>95.5</td>
</tr>
</tbody>
</table>

SOURCE: Rand analysis of FY 1970 "Case Service Reports."

**Table 9.13**

YOUNG VR REHABILITANTS BY SOURCE OF SUPPORT AT TIME OF APPLICATION, FY 1970

(In percent)

<table>
<thead>
<tr>
<th>Primary Source of Support</th>
<th>Blind</th>
<th>Partially sighted: Legally Blind</th>
<th>Partially sighted: 20/70 up to 20/200 Acuity</th>
<th>One Good Eye</th>
<th>Other Visual Impairment</th>
<th>Deaf, Unable to Talk</th>
<th>Deaf, Able to Talk</th>
<th>Other Hearing Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current earnings, interest, dividends, rent</td>
<td>6.5</td>
<td>9.1</td>
<td>10.6</td>
<td>11.3</td>
<td>14.6</td>
<td>8.1</td>
<td>11.6</td>
<td>13.4</td>
</tr>
<tr>
<td>Family and friends</td>
<td>75.8</td>
<td>77.2</td>
<td>83.5</td>
<td>83.9</td>
<td>74.6</td>
<td>84.6</td>
<td>83.7</td>
<td>81.0</td>
</tr>
<tr>
<td>Private relief agency</td>
<td>0.0</td>
<td>0.1</td>
<td>0.2</td>
<td>0.0</td>
<td>0.3</td>
<td>0.0</td>
<td>0.2</td>
<td>0.1</td>
</tr>
<tr>
<td>Public assistance, at least partly with federal funds</td>
<td>11.3</td>
<td>8.7</td>
<td>2.6</td>
<td>1.4</td>
<td>3.3</td>
<td>3.2</td>
<td>1.4</td>
<td>2.1</td>
</tr>
<tr>
<td>Public assistance, without federal funds</td>
<td>0.0</td>
<td>0.4</td>
<td>0.2</td>
<td>0.1</td>
<td>0.8</td>
<td>0.1</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Public institution, tax-supported</td>
<td>1.7</td>
<td>1.6</td>
<td>0.4</td>
<td>1.1</td>
<td>3.3</td>
<td>3.0</td>
<td>1.2</td>
<td>1.5</td>
</tr>
<tr>
<td>Workmen's Compensation</td>
<td>0.4</td>
<td>0.1</td>
<td>0.2</td>
<td>0.3</td>
<td>0.0</td>
<td>0.1</td>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Social Security Disability Insurance</td>
<td>2.6</td>
<td>1.1</td>
<td>0.2</td>
<td>0.0</td>
<td>0.2</td>
<td>0.6</td>
<td>0.1</td>
<td>0.4</td>
</tr>
<tr>
<td>Other disability, sickness, survivors, or age retirement (except private insurance); unemployment insurance benefits</td>
<td>1.3</td>
<td>1.1</td>
<td>1.1</td>
<td>1.1</td>
<td>0.6</td>
<td>0.2</td>
<td>0.9</td>
<td>0.8</td>
</tr>
<tr>
<td>Annuity and other nondisability insurance (private insurance)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.1</td>
<td>0.0</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Disability or sickness benefits (private insurance); savings; other sources</td>
<td>0.4</td>
<td>0.6</td>
<td>0.9</td>
<td>0.7</td>
<td>2.1</td>
<td>0.0</td>
<td>0.5</td>
<td>0.6</td>
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SOURCE: Rand analysis of FY 1970 "Case Service Reports."
Table 9.14

<table>
<thead>
<tr>
<th>Income Range ($)</th>
<th>Blind</th>
<th>Partially Sighted: Legally Blind</th>
<th>Partially Sighted: 20/70 up to 20/200 Acuity</th>
<th>One Good Eye</th>
<th>Other Visual Impairment</th>
<th>Deaf, Unable to Talk</th>
<th>Deaf, Able to Talk</th>
<th>Other Hearing Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-149</td>
<td>26.5</td>
<td>21.0</td>
<td>17.0</td>
<td>14.5</td>
<td>19.7</td>
<td>17.0</td>
<td>11.5</td>
<td>13.4</td>
</tr>
<tr>
<td>150-199</td>
<td>6.5</td>
<td>7.2</td>
<td>7.5</td>
<td>6.5</td>
<td>9.0</td>
<td>4.2</td>
<td>3.9</td>
<td>4.9</td>
</tr>
<tr>
<td>200-249</td>
<td>7.1</td>
<td>7.5</td>
<td>7.5</td>
<td>7.6</td>
<td>11.1</td>
<td>8.7</td>
<td>7.3</td>
<td>8.0</td>
</tr>
<tr>
<td>250-299</td>
<td>5.3</td>
<td>7.6</td>
<td>9.8</td>
<td>7.6</td>
<td>7.9</td>
<td>5.7</td>
<td>8.1</td>
<td>6.3</td>
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<tr>
<td>300-349</td>
<td>8.8</td>
<td>9.2</td>
<td>9.8</td>
<td>11.0</td>
<td>9.0</td>
<td>9.9</td>
<td>6.7</td>
<td>8.2</td>
</tr>
<tr>
<td>350-399</td>
<td>7.1</td>
<td>7.4</td>
<td>3.6</td>
<td>5.4</td>
<td>7.7</td>
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<td>7.0</td>
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<tr>
<td>400-449</td>
<td>7.1</td>
<td>7.0</td>
<td>10.6</td>
<td>9.8</td>
<td>7.1</td>
<td>10.6</td>
<td>11.8</td>
<td>11.3</td>
</tr>
<tr>
<td>450-499</td>
<td>4.1</td>
<td>5.5</td>
<td>5.6</td>
<td>5.3</td>
<td>5.4</td>
<td>5.4</td>
<td>6.3</td>
<td>6.9</td>
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<tr>
<td>500-599</td>
<td>7.6</td>
<td>8.0</td>
<td>10.9</td>
<td>11.6</td>
<td>20.0</td>
<td>10.3</td>
<td>11.4</td>
<td>11.5</td>
</tr>
<tr>
<td>500 and over</td>
<td>20.0</td>
<td>19.5</td>
<td>17.6</td>
<td>20.6</td>
<td>14.0</td>
<td>23.0</td>
<td>26.6</td>
<td>22.5</td>
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<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
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</table>

SOURCE: Rand analysis of FY 1970 "Case Service Reports."

Table 9.15

<table>
<thead>
<tr>
<th>Assistance Category</th>
<th>Ref. Closer</th>
<th>Closer</th>
<th>Closer</th>
<th>Closer</th>
<th>Closer</th>
<th>Closer</th>
<th>Closer</th>
<th>Closer</th>
<th>Closer</th>
<th>Closer</th>
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<th>Closer</th>
<th>Closer</th>
<th>Closer</th>
<th>Closer</th>
<th>Closer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blind</td>
<td>70.4</td>
<td>80.2</td>
<td>70.6</td>
<td>81.8</td>
<td>88.8</td>
<td>96.1</td>
<td>96.0</td>
<td>99.2</td>
<td>92.0</td>
<td>97.3</td>
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<td>95.4</td>
<td>98.4</td>
<td>95.4</td>
<td>98.4</td>
<td></td>
</tr>
<tr>
<td>Partially sighted</td>
<td>13.7</td>
<td>12.7</td>
<td>14.5</td>
<td>0.9</td>
<td>2.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.1</td>
<td>0.3</td>
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<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Partially sighted: 20/70 up to 20/200 Acuity</td>
<td>6.4</td>
<td>0.0</td>
<td>0.3</td>
<td>0.3</td>
<td>0.7</td>
<td>0.2</td>
<td>0.1</td>
<td>0.0</td>
<td>0.2</td>
<td>0.1</td>
<td>1.5</td>
<td>1.1</td>
<td>0.4</td>
<td>0.1</td>
<td>0.7</td>
<td>0.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One Good Eye</td>
<td>67.3</td>
<td>62.2</td>
<td>54.3</td>
<td>47.7</td>
<td>43.5</td>
<td>37.7</td>
<td>31.7</td>
<td>25.7</td>
<td>19.7</td>
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<td>4.7</td>
<td>2.7</td>
<td>1.7</td>
<td>1.7</td>
<td>1.7</td>
<td>1.7</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>Other Visual Impairment</td>
<td>4.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.7</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
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<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Deaf, Unable to Talk</td>
<td>9.1</td>
<td>8.1</td>
<td>7.1</td>
<td>6.1</td>
<td>5.1</td>
<td>4.1</td>
<td>3.1</td>
<td>2.1</td>
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<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Deaf, Able to Talk</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
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<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Other Hearing Impairment</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
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<td>0.1</td>
<td>0.1</td>
<td></td>
</tr>
</tbody>
</table>

SOURCE: Rand analysis of FY 1970 "Case Service Reports."

NOTE: Ref = time of referral; Closer = time of closure; N.A. = not applicable.

closure and 5 percent were in a state-agency-managed business enterprise (comparable figures for deaf youth unable to talk are 4 percent and 0 percent, respectively).

Average reported weekly earnings for hearing and vision handicapped youth were $8 at referral, and $84 at closure. The highest average earnings at closure, $93, were for youth with one good eye. (See Table 9.17 for details). Note that average earnings across the various types of handicaps are fairly constant, from $5 to $10 per week at referral, and from $80 to $93 at closure. Figure 9.1 portrays the distribution of earnings at closure in relation to the 1970 national "minimum wage" of $1.60 per hour. Only about two-thirds of the rehabilitated youth earned more than $44, the minimum wage for a 40-hour workweek, and less than 20 percent earned over $100 per week. In comparison, the median May 1970 weekly earnings of salaried
### Table 9.16
PERCENTAGES OF REHABILITATED YOUTH IN VARIOUS WORK STATUS CATEGORIES, FY 1970 CLOSURES

<table>
<thead>
<tr>
<th>Work Status Category</th>
<th>Blind</th>
<th>Partially Sighted: Legally Blind</th>
<th>Partially Sighted: 20/70 up to 20/200 Acuity</th>
<th>One Good Eye</th>
<th>Other Visual Impairment</th>
<th>Deaf, Unable to Talk</th>
<th>Deaf, Able to Talk</th>
<th>Other Hearing Impairment</th>
<th>All Types of Sensory Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive labor market</td>
<td>5.0</td>
<td>3.8</td>
<td>8.6</td>
<td>66.7</td>
<td>10.8</td>
<td>80.8</td>
<td>13.6</td>
<td>92.7</td>
<td>15.6</td>
</tr>
<tr>
<td>Sheltered workshop</td>
<td>2.9</td>
<td>20.5</td>
<td>0.9</td>
<td>134</td>
<td>0.9</td>
<td>3.1</td>
<td>0.0</td>
<td>0.5</td>
<td>0.3</td>
</tr>
<tr>
<td>Self-employed</td>
<td>0.0</td>
<td>3.1</td>
<td>0.1</td>
<td>21.4</td>
<td>0.2</td>
<td>1.8</td>
<td>0.1</td>
<td>1.2</td>
<td>0.2</td>
</tr>
<tr>
<td>State-agency-managed business enterprise</td>
<td>0.0</td>
<td>3.1</td>
<td>0.5</td>
<td>5.0</td>
<td>0.0</td>
<td>0.7</td>
<td>0.0</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Homemaker</td>
<td>3.1</td>
<td>11.6</td>
<td>2.1</td>
<td>10.9</td>
<td>3.3</td>
<td>7.4</td>
<td>0.7</td>
<td>4.5</td>
<td>1.1</td>
</tr>
<tr>
<td>Unpaid family worker</td>
<td>0.0</td>
<td>3.9</td>
<td>0.9</td>
<td>1.5</td>
<td>0.2</td>
<td>0.3</td>
<td>1.1</td>
<td>0.0</td>
<td>0.4</td>
</tr>
<tr>
<td>Not working, student</td>
<td>49.6</td>
<td>0.0</td>
<td>67.2</td>
<td>0.0</td>
<td>53.8</td>
<td>0.0</td>
<td>36.1</td>
<td>0.0</td>
<td>49.7</td>
</tr>
<tr>
<td>Not working, other</td>
<td>38.1</td>
<td>0.0</td>
<td>39.2</td>
<td>0.0</td>
<td>29.4</td>
<td>0.0</td>
<td>28.8</td>
<td>0.0</td>
<td>29.0</td>
</tr>
<tr>
<td>Trainee or worker (non-competitive labor market)</td>
<td>1.3</td>
<td>0.0</td>
<td>0.2</td>
<td>0.0</td>
<td>0.2</td>
<td>0.0</td>
<td>0.4</td>
<td>0.0</td>
<td>4.1</td>
</tr>
</tbody>
</table>

**SOURCE:** Rand analysis of FY 1970 "Case Service Reports."

**NOTE:** Columns may not total exactly to 100 due to rounding. Ref = time of referral; Cls = time of closure.

### Table 9.17
PERCENTAGES OF REHABILITATIONS IN VARIOUS WEEKLY EARNINGS RANGES, FY 1970 CLOSURES

<table>
<thead>
<tr>
<th>Earnings ($)</th>
<th>Blind</th>
<th>Partially Sighted: Legally Blind</th>
<th>Partially Sighted: 20/70 up to 20/200 Acuity</th>
<th>One Good Eye</th>
<th>Other Visual Impairment</th>
<th>Deaf, Unable to Talk</th>
<th>Deaf, Able to Talk</th>
<th>Other Hearing Impairment</th>
<th>All Types of Sensory Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>150 and up</td>
<td>11.0</td>
<td>0.7</td>
<td>5.3</td>
<td>6.3</td>
<td>2.4</td>
<td>6.2</td>
<td>0.8</td>
<td>6.0</td>
<td>2.5</td>
</tr>
<tr>
<td>60-99</td>
<td>3.7</td>
<td>35.1</td>
<td>1.1</td>
<td>40.9</td>
<td>4.4</td>
<td>68.8</td>
<td>4.9</td>
<td>47.3</td>
<td>4.4</td>
</tr>
<tr>
<td>40-59</td>
<td>1.9</td>
<td>11.5</td>
<td>1.3</td>
<td>46.6</td>
<td>2.9</td>
<td>12.6</td>
<td>3.5</td>
<td>9.8</td>
<td>6.2</td>
</tr>
<tr>
<td>20-19</td>
<td>0.4</td>
<td>8.4</td>
<td>1.3</td>
<td>9.6</td>
<td>1.2</td>
<td>5.9</td>
<td>3.5</td>
<td>9.4</td>
<td>4.7</td>
</tr>
<tr>
<td>0-19</td>
<td>83.3</td>
<td>22.1</td>
<td>86.9</td>
<td>18.1</td>
<td>87.9</td>
<td>10.1</td>
<td>86.6</td>
<td>7.7</td>
<td>82.0</td>
</tr>
<tr>
<td>Average</td>
<td>5.5</td>
<td>580</td>
<td>8</td>
<td>675</td>
<td>5.7</td>
<td>586</td>
<td>9</td>
<td>693</td>
<td>5.0</td>
</tr>
</tbody>
</table>

**SOURCE:** Rand analysis of FY 1970 "Case Service Reports."

**NOTE:** Ref = time of referral; Cls = time of closure.

Workers aged 16 to 24 were $88 and $112 for females and males, respectively. The low level of earnings at referral is not due simply to the young age of the clients, since the average earnings at time of referral for VR rehabilitants of all ages was only $14 per week.

### Services Provided to Youth

In addition to services such as vocational planning, counseling, and job placement which VR clients receive from the state agencies' rehabilitation counselors, agencies may purchase other services for clients. As shown in Table 9.18, nearly all sensorially impaired clients receive professional diagnostic and evaluation services to determine eligibility and the scope of other services needed. Nearly half of the rehabilitated youth received medical or medically related restorative services, and over three-quarters received vocational training. About one-third of the rehabilitants received income maintenance while participating in the VR program, and 30
Fig. 9.1—Weekly earnings at time of case closure

Table 9.18
PERCENTAGES OF YOUNG VR CLIENTS RECEIVING VARIOUS TYPES OF SERVICES, FY 1970 CLOSURES

<table>
<thead>
<tr>
<th>Type and Degree of Sensory Handicap</th>
<th>Diagnosis and Evaluation</th>
<th>Restoration</th>
<th>Training</th>
<th>Income Maintenance</th>
<th>Services to Other Family Members</th>
<th>Other Services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Rehab Rehab</td>
<td>Not Rehab Rehab</td>
<td>Not Rehab Rehab</td>
<td>Not Rehab Rehab</td>
<td>Not Rehab Rehab</td>
<td>Not Rehab Rehab</td>
</tr>
<tr>
<td>Blind</td>
<td>95 93</td>
<td>31 33</td>
<td>95 85</td>
<td>44 57</td>
<td>3 7</td>
<td>33 40</td>
</tr>
<tr>
<td>Partially sighted—legally blind</td>
<td>89 91</td>
<td>15 37</td>
<td>57 81</td>
<td>23 49</td>
<td>1 2</td>
<td>33 40</td>
</tr>
<tr>
<td>Partially sighted—20/70 up to 20/200 acuity</td>
<td>100 95</td>
<td>24 31</td>
<td>61 82</td>
<td>25 42</td>
<td>0 1</td>
<td>25 35</td>
</tr>
<tr>
<td>One good eye</td>
<td>93 96</td>
<td>17 33</td>
<td>40 77</td>
<td>19 30</td>
<td>0 1</td>
<td>13 22</td>
</tr>
<tr>
<td>Other visual impairment</td>
<td>94 96</td>
<td>33 66</td>
<td>40 65</td>
<td>7 27</td>
<td>2 2</td>
<td>14 24</td>
</tr>
<tr>
<td>Deaf, unable to talk</td>
<td>94 97</td>
<td>22 35</td>
<td>63 83</td>
<td>19 36</td>
<td>3 9</td>
<td>30 44</td>
</tr>
<tr>
<td>Deaf, able to talk</td>
<td>98 96</td>
<td>37 53</td>
<td>54 78</td>
<td>11 30</td>
<td>4 5</td>
<td>22 33</td>
</tr>
<tr>
<td>Other hearing impairment</td>
<td>98 96</td>
<td>24 57</td>
<td>32 70</td>
<td>8 30</td>
<td>3 3</td>
<td>13 24</td>
</tr>
<tr>
<td>All types combined</td>
<td>96 96</td>
<td>25 47</td>
<td>47 76</td>
<td>18 34</td>
<td>2 3</td>
<td>20 30</td>
</tr>
</tbody>
</table>

SOURCE: Rand analysis of FY 1970 "Case Service Reports."
percent received other services such as reader or interpreter services, occupational tools and equipment, initial stocks, licenses, or transportation. Except for medically related restorative and diagnostic services, the more severe the disability, the more likely a rehabilitant was to have received each service.

**Time Spent in Program**

The average time between referral and acceptance for service for hearing and vision handicapped youth rehabilitants is 6 months, and between acceptance and closure is 19 months, for a total of 25 months. Clients who received training spent an average of 17 months in the training phase of the program alone. Clients who were not successfully rehabilitated spent nearly as long from referral to case closure, an average of 24 months. (See Table 9.19.) For comparison, the average time from referral to case closure for all physically or mentally handicapped youth was 21 months, and for all clients of all ages, 19 months.

Table 9.19

<table>
<thead>
<tr>
<th>Type and Degree of Sensorial Handicap</th>
<th>Average Months from Referral to Acceptance</th>
<th>Average Months in Training(^a)</th>
<th>Average Months from Time &quot;Ready for Employment&quot; to Closure(^b)</th>
<th>Average Months from Acceptance to Closure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blind</td>
<td>6  9</td>
<td>14  16</td>
<td>15  6</td>
<td>21  22</td>
</tr>
<tr>
<td>Partially sighted—legally blind</td>
<td>8  8</td>
<td>14  16</td>
<td>12  5</td>
<td>19  18</td>
</tr>
<tr>
<td>Partially sighted—20/70 up to 20/200 acuity</td>
<td>6  7</td>
<td>15  17</td>
<td>8  5</td>
<td>19  22</td>
</tr>
<tr>
<td>One good eye</td>
<td>5  5</td>
<td>15  19</td>
<td>9  5</td>
<td>17  21</td>
</tr>
<tr>
<td>Other visual impairment</td>
<td>5  5</td>
<td>14  16</td>
<td>9  4</td>
<td>17  16</td>
</tr>
<tr>
<td>Deaf, unable to talk</td>
<td>8  7</td>
<td>12  14</td>
<td>13  5</td>
<td>20  19</td>
</tr>
<tr>
<td>Deaf, able to talk</td>
<td>6  6</td>
<td>12  16</td>
<td>11  6</td>
<td>19  20</td>
</tr>
<tr>
<td>Other hearing impairment</td>
<td>5  5</td>
<td>14  17</td>
<td>11  5</td>
<td>16  19</td>
</tr>
<tr>
<td>All types combined</td>
<td>6  6</td>
<td>14  17</td>
<td>11  5</td>
<td>18  19</td>
</tr>
</tbody>
</table>

SOURCE: Rand analysis of FY 1970 "Case Service Reports."

\(^a\)For those who received training only.

\(^b\)For those who reached the state of being "ready for employment only."

**Expenditures for VR for Hearing and Vision Handicapped Youth, FY 1970**

Estimated expenditures for hearing and vision handicapped youth under the basic state-federal VR program in FY 1970 were $20,408,000. Of that amount, $11,428,000 was for the "cost of services" and the remainder was for the cost of state counselors and for operation of the state agency.\(^{15}\)

\(^{15}\)Assuming, for lack of better data, that all expenditures are distributed by type of handicap in the same proportions as "cost-of-services" expenditures are distributed by type of handicap.
Average total expenditures per youth accepted were $1765, while expenditures per youth successfully rehabilitated were $2103. Expenditures per rehabilitant decreased with degree of severity, from $6167 for a blind youth to $1362 for a youth with "other visual impairment," and from $2068 for a deaf youth unable to talk to $1678 for a youth with "other hearing impairment." Note that three times as much is expended per blind youth as is expended per deaf youth who is unable to talk. (Table 9.20 provides details.)

The extremely wide variation in the cost of services by handicap and by state is shown in Table 9.21. For example, the 1970 average costs of services (which are slightly more than half of total expenditures) per blind youth rehabilitated averaged $927 in the United States, but 5 states averaged less than $1000, while 8 states averaged more than $6000. Average expenditures per young rehabilitant with one good eye varied across states from less than $100 to more than $3000. The U.S. average per young deaf rehabilitant unable to talk was $1081, but 4 states averaged under $200 and 6 states averaged over $2000.

**Table 9.20**

<table>
<thead>
<tr>
<th>Type and Degree of Sensory Handicap</th>
<th>Total Cost of Services (000)</th>
<th>Estimated Total Expenditures (000)</th>
<th>Average Total Expenditures per Youth</th>
<th>Percent of Expenditures Incurred by Handicap Group</th>
<th>Average Cost of Services per Youth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Accepted</td>
<td>Rehab</td>
<td>Not Accepted Accepted Rehab</td>
<td></td>
</tr>
<tr>
<td>Blind</td>
<td>$908</td>
<td>$1,422</td>
<td>$6,771</td>
<td>8.0</td>
<td>$31$2,796$3,227</td>
</tr>
<tr>
<td>Partially sighted—legally blind</td>
<td>2,395</td>
<td>4,777</td>
<td>3,365</td>
<td>21.0</td>
<td>271,9272,179</td>
</tr>
<tr>
<td>Partially sighted—20/50 or better</td>
<td>596</td>
<td>1,046</td>
<td>1,916</td>
<td>5.1</td>
<td>241,3351,269</td>
</tr>
<tr>
<td>Partially sighted—20/100 or better</td>
<td>1,059</td>
<td>3,677</td>
<td>1,685</td>
<td>18.0</td>
<td>10847939</td>
</tr>
<tr>
<td>One good eye</td>
<td>1,344</td>
<td>2,764</td>
<td>1,166</td>
<td>13.3</td>
<td>130658722</td>
</tr>
<tr>
<td>Other visual impairment</td>
<td>1,540</td>
<td>2,764</td>
<td>1,166</td>
<td>13.3</td>
<td>130658722</td>
</tr>
<tr>
<td>Deaf, unable to talk</td>
<td>1,086</td>
<td>1,936</td>
<td>1,607</td>
<td>9.3</td>
<td>179411,081</td>
</tr>
<tr>
<td>Deaf, able to talk</td>
<td>1,224</td>
<td>2,186</td>
<td>1,631</td>
<td>10.7</td>
<td>159581,048</td>
</tr>
<tr>
<td>Other hearing impairment</td>
<td>1,624</td>
<td>2,900</td>
<td>1,154</td>
<td>14.2</td>
<td>14826910</td>
</tr>
<tr>
<td>Total</td>
<td>$11,428</td>
<td>$20,408</td>
<td>$17,753</td>
<td>100.0</td>
<td>$15$1,024$1,120</td>
</tr>
</tbody>
</table>

SOURCE: Rand analysis of FY 1970 "Case Service Reports."

*Assumes that the U.S. average of 50 percent of total expenditures on "services to individuals" holds for each group of handicapped youth. Only 1 percent of the youth accepted into the VR programs are eligible to have the Social Security Trust Fund pay costs. These costs are included in the totals presented.

### COMMITTEES ON EMPLOYMENT OF THE HANDICAPPED

The Presidential Committee on Employment of the Handicapped, the corresponding Governors' Committees on Employment of the Handicapped in the 50 states, and hundreds of local committees promote employment opportunities for the mentally and physically impaired. Primarily, these committees endeavor to educate potential employers and the public regarding the vocational abilities of the handicapped, rather than provide individual placement services. Many of the committees are also active in backing legislation to remove barriers to employment of the handicapped, including physical obstacles in architecture and transportation.

The FY 1972 budget estimate for the Presidential Committee was $726,000 for persons of all ages. Since approximately 21 percent of the U.S. population who have some chronic physical or mental condition that may limit their activities are under
Table 9.21
AVERAGE COST OF SERVICES PER YOUTH SUCCESSFULLY REHABILITATED,
BY STATE, FY 1970 CLOSURES
(In $)

<table>
<thead>
<tr>
<th>U.S. Figures/State Figures</th>
<th>Partially Sighted Legally Blind</th>
<th>Partially Sighted 20/70 up to 20/200 Acuity</th>
<th>One Good Eye</th>
<th>Other Visual Impairment</th>
<th>Deaf, Unable To Talk</th>
<th>Deaf, Able To Talk</th>
<th>Other Hearing Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alabama</td>
<td>4398</td>
<td>4034</td>
<td>1339</td>
<td>756</td>
<td>341</td>
<td>2892</td>
<td>1750</td>
</tr>
<tr>
<td>Alaska</td>
<td>--</td>
<td>3693</td>
<td>1339</td>
<td>756</td>
<td>341</td>
<td>2892</td>
<td>1750</td>
</tr>
<tr>
<td>Arizona b</td>
<td>758</td>
<td>3548</td>
<td>168</td>
<td>336</td>
<td>155</td>
<td>372</td>
<td>237</td>
</tr>
<tr>
<td>Arkansas b</td>
<td>1951</td>
<td>2057</td>
<td>1475</td>
<td>610</td>
<td>1538</td>
<td>1082</td>
<td>559</td>
</tr>
<tr>
<td>California</td>
<td>2824</td>
<td>1086</td>
<td>400</td>
<td>642</td>
<td>561</td>
<td>817</td>
<td>478</td>
</tr>
<tr>
<td>Colorado</td>
<td>2128</td>
<td>1099</td>
<td>1032</td>
<td>656</td>
<td>967</td>
<td>1606</td>
<td>816</td>
</tr>
<tr>
<td>Connecticut b</td>
<td>4380</td>
<td>1545</td>
<td>2873</td>
<td>482</td>
<td>3317</td>
<td>1150</td>
<td>1579</td>
</tr>
<tr>
<td>Delaware b</td>
<td>--</td>
<td>3934</td>
<td>2873</td>
<td>482</td>
<td>3317</td>
<td>1150</td>
<td>1579</td>
</tr>
<tr>
<td>D.C.</td>
<td>7708</td>
<td>511</td>
<td>124</td>
<td>126</td>
<td>1798</td>
<td>518</td>
<td>99</td>
</tr>
<tr>
<td>Florida b</td>
<td>5020</td>
<td>1935</td>
<td>5122</td>
<td>526</td>
<td>389</td>
<td>1168</td>
<td>791</td>
</tr>
<tr>
<td>Georgia</td>
<td>1371</td>
<td>1262</td>
<td>677</td>
<td>867</td>
<td>370</td>
<td>752</td>
<td>1164</td>
</tr>
<tr>
<td>Hawaii</td>
<td>562</td>
<td>1598</td>
<td>2230</td>
<td>1890</td>
<td>306</td>
<td>701</td>
<td>477</td>
</tr>
<tr>
<td>Idaho b</td>
<td>--</td>
<td>940</td>
<td>1333</td>
<td>617</td>
<td>279</td>
<td>256</td>
<td>832</td>
</tr>
<tr>
<td>Illinois</td>
<td>1630</td>
<td>1437</td>
<td>1677</td>
<td>915</td>
<td>922</td>
<td>1073</td>
<td>1629</td>
</tr>
<tr>
<td>Indiana b</td>
<td>2188</td>
<td>1972</td>
<td>903</td>
<td>729</td>
<td>1034</td>
<td>736</td>
<td>605</td>
</tr>
<tr>
<td>Iowa b</td>
<td>3489</td>
<td>5274</td>
<td>547</td>
<td>760</td>
<td>301</td>
<td>1083</td>
<td>650</td>
</tr>
<tr>
<td>Kansas b</td>
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<td>3721</td>
<td>736</td>
<td>1298</td>
<td>1212</td>
<td>547</td>
<td>768</td>
</tr>
<tr>
<td>Kentucky</td>
<td>4389</td>
<td>1150</td>
<td>848</td>
<td>533</td>
<td>333</td>
<td>576</td>
<td>406</td>
</tr>
<tr>
<td>Louisiana b</td>
<td>940</td>
<td>1972</td>
<td>691</td>
<td>967</td>
<td>1334</td>
<td>173</td>
<td>1663</td>
</tr>
<tr>
<td>Maine b</td>
<td>--</td>
<td>6866</td>
<td>--</td>
<td>3319</td>
<td>1158</td>
<td>2277</td>
<td>1185</td>
</tr>
<tr>
<td>Maryland</td>
<td>440</td>
<td>428</td>
<td>255</td>
<td>261</td>
<td>99</td>
<td>675</td>
<td>502</td>
</tr>
<tr>
<td>Massachusetts b</td>
<td>12915</td>
<td>2543</td>
<td>1767</td>
<td>2034</td>
<td>1724</td>
<td>655</td>
<td>862</td>
</tr>
<tr>
<td>Michigan b</td>
<td>1575</td>
<td>1871</td>
<td>361</td>
<td>593</td>
<td>463</td>
<td>874</td>
<td>535</td>
</tr>
<tr>
<td>Minnesota b</td>
<td>5332</td>
<td>3104</td>
<td>1129</td>
<td>1367</td>
<td>2321</td>
<td>132</td>
<td>224</td>
</tr>
<tr>
<td>Mississippi b</td>
<td>8828</td>
<td>2212</td>
<td>1670</td>
<td>1249</td>
<td>973</td>
<td>182</td>
<td>1079</td>
</tr>
<tr>
<td>Missouri b</td>
<td>5237</td>
<td>2215</td>
<td>1662</td>
<td>1221</td>
<td>693</td>
<td>1303</td>
<td>1006</td>
</tr>
<tr>
<td>Montana b</td>
<td>5270</td>
<td>1364</td>
<td>4172</td>
<td>900</td>
<td>707</td>
<td>865</td>
<td>587</td>
</tr>
<tr>
<td>Nebraska b</td>
<td>6412</td>
<td>1655</td>
<td>920</td>
<td>1171</td>
<td>1621</td>
<td>1810</td>
<td>1131</td>
</tr>
<tr>
<td>Nevada b</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>55</td>
<td>449</td>
<td>249</td>
<td>231</td>
</tr>
<tr>
<td>New Hampshire b</td>
<td>--</td>
<td>1799</td>
<td>1792</td>
<td>1922</td>
<td>23</td>
<td>1200</td>
<td>999</td>
</tr>
<tr>
<td>New Jersey</td>
<td>(c)</td>
<td>(c)</td>
<td>(c)</td>
<td>(c)</td>
<td>(c)</td>
<td>(c)</td>
<td>(c)</td>
</tr>
<tr>
<td>New Mexico b</td>
<td>2872</td>
<td>984</td>
<td>999</td>
<td>176</td>
<td>964</td>
<td>333</td>
<td>1011</td>
</tr>
<tr>
<td>New York b</td>
<td>3114</td>
<td>2917</td>
<td>1196</td>
<td>1845</td>
<td>1497</td>
<td>1483</td>
<td>1634</td>
</tr>
<tr>
<td>North Carolina b</td>
<td>7764</td>
<td>5382</td>
<td>1480</td>
<td>1226</td>
<td>927</td>
<td>582</td>
<td>574</td>
</tr>
<tr>
<td>North Dakota b</td>
<td>6758</td>
<td>2388</td>
<td>1204</td>
<td>1140</td>
<td>1165</td>
<td>1027</td>
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<td>--</td>
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<td>1073</td>
<td>81</td>
<td>1190</td>
<td>--</td>
<td>2331</td>
</tr>
</tbody>
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a Data presented on persons under age 22 have been computed at The Rand Corporation from FY 1970 "Case Service Reports," DHW form RSA-300, submitted on each individual applicant at the time of case closure. The average presented is the total cost of services to successful rehabilitants divided by the number of successful rehabilitants.

b In 1970, state had a separate VR agency for the visually handicapped, in addition to one for all other handicaps combined.

c Not available.
age 22, we estimate that 21 percent of the $726,000 budget, or $152,000, goes to handicapped youth. Governors’ Committee budgets and staffs are small. The Massachusetts Committee, for example, runs on $450 annually with two staff members loaned from the state employment service. Illinois is exceptional, with a relatively high annual budget of $146,000. At these still low levels of expenditure, the committees cannot develop an extensive, high-quality set of public and employer education material; nor can they fund extensive campaigns in the media.

FEDERAL EMPLOYMENT OF THE HANDICAPPED

The Civil Service Commission provides assistance to handicapped persons seeking federal employment. Budget obligations in FY 1970 and FY 1972 were $70,000 and $72,000, respectively.

THE RANDOLPH-SHEPPARD VENDING STAND PROGRAM

In FY 1971 a total of 3454 blind and visually handicapped persons operated vending stands in governmental buildings and earned an average of $6540 each from the businesses. It is assumed that only a small fraction of the operators are under 21.

EMPLOYMENT SERVICES

In FY 1970 the federal government budgeted $348 million for grants to states for employment services, including interviewing, counseling, and job placement referrals for individuals. This amount averaged $35 for each of the 9,957,000 applicants for services in that year. The objective of these services is not vocational rehabilitation, but the matching of potential employees with employers. Special attention reportedly is given to the physically and mentally handicapped and other disadvantaged groups.

The total nonagricultural placements of handicapped persons of all ages in the United States in FY 1969 by the Employment Service program were 324,000; and that number grew about 22,900 from 1966 to 1969. The data from this program are not extensive, and the number of hearing and vision handicapped youth served is not reliably known. Our estimate of over 11,000 in 1970 is based on the assumption that the age breakdown of state employment service expenditures for handicapped persons is similar to that in the VR program.

Difficulties with the Employment Service program were noted in the 1973 Manpower Report of the President: "... with the ES caught in an avalanche of new

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15 Financial data from staff members of the Illinois and Massachusetts Governors’ Committees on Employment for the Handicapped.
18 Data from Manpower Administration, U.S. Department of Labor, Washington, D.C.
responsibilities, its effectiveness—as measured by the number of job placements made—has declined sharply in recent years. ... Between 1966 and 1970 ... ES non-farm placements dropped 30 percent ... contacts with employers dropped 20 percent ... accompanied by a decline of one-third in the number of job openings obtained. ... The number of placements of disadvantaged workers also fell."

During our five-state interviews with VR and employment service personnel, several observations on the employment service program were made which, if accurate, bear further investigation: (1) information on each job and client were said to be generally insufficient to permit effective matching of the handicapped client’s abilities with job requirements; (2) employment service personnel were said to have such high client loads in most states that they often were unable to provide good placement service to handicapped persons; and (3) specialists in serving handicapped persons were said to be insufficient in number, with the result that personnel without special training often served handicapped persons.

**BENEFIT-COST ANALYSIS OF VOCATIONAL SERVICES FOR HEARING AND VISION HANDICAPPED YOUTH**

Previous studies have concluded that the VR program for handicapped persons has yielded benefits that considerably outweigh the cost of the program. For example, a 1967 study by the U.S. Vocational Rehabilitation Administration found that each dollar of cost in FY 1966 generated an estimated $35 in increased clients’ earnings and value of work activity over their working lives.

A more thorough study, using more conservative assumptions, has been made by Ronald W. Conley. His analysis of the VR program focuses on economic costs and benefits, makes sophisticated use of available data, and clearly states the assumptions used in making estimates. With 1967 data, Conley estimates that for each dollar of the social cost of rehabilitation services, an increase in lifetime earnings of a little less than $5 accrues (at a 4-percent discount rate on future increased earnings). He also estimates that "the increased taxes paid by the rehabilitants and the reduction in tax supported payments for their maintenance amount to perhaps as much as 25 percent of the total increase in earnings." Critical assumptions underlying these and all other estimates relate to how one estimates what earnings would have been without rehabilitation, and what the employment record of the rehabilitant will be over his lifetime.

In the following analysis, we will use Conley’s methodology, with some significant adaptations. First, previous analyses have generally dealt with the program as a whole, not with disaggregations by type and degree of handicap and by age of the recipient. We will investigate the program’s costs and benefits for eight categories of hearing and vision handicapped youth, and will also look at differences based on sex and race. Second, although the data for the VR program are generally better

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20 1972 interviews with VR personnel in Arkansas, California, Illinois, Massachusetts, and Wyoming, and with ES personnel in Massachusetts and Illinois.
22 *The Economics of Vocational Rehabilitation*, Johns Hopkins University Press, Baltimore, Maryland, 1965; and see idem, "A Benefit-Cost Analysis of the Vocational Rehabilitation Program," *The Journal of Human Resources*, Vol. 4, No. 2, April 1969, for one of the best of these benefit-cost studies and a review of others. See also Rand Report R-1220-HEW, Chapter 5, for citations of other recent and ongoing analyses.
than data for any other program we investigated, benefit-cost analyses must still
resort to assumptions where data are incomplete. We will vary certain of those
assumptions and note the sensitivity of estimated benefits to the variations.

The analyses in the remainder of this section will concentrate on economic
benefits, which are only one of the various types of benefits on which this program
can be evaluated. Earlier in this chapter we presented available data on other
classes of criteria, such as degree of change in nondependence and equity of service
distribution. Data are not available for one of the most significant classes of effects,
changes in the overall quality of life of youth served. As will be seen, the VR program
appears justified by its economic benefits alone. Other unquantified but very signific-
ant major types of benefits add still more support for this program.

Benefit-Cost Methodology

For a more detailed description of the methodology we are using with certain
adaptations, the reader is referred to Conley's works. The methodology is briefly
discussed here to lay out its underlying assumptions. We first describe components
of cost, and then discuss the calculation of economic benefits.

Basic Program Costs. The basic program costs include those of administra-
tion, vocational counselors, case services, and the establishment and support of
rehabilitation facilities and workshops. When considering the effectiveness of the
total program, it is possible to use the budget as an indicator of the program cost.
However, if we want to make distinctions among the various groups participating
in the program, we must try to disaggregate the cost. The only expenditure that is
kept in a client's file is that for case services, such as medical diagnostics, treatment,
or vocational training. The other costs are generally treated as "overhead" and are
not attributed directly to individual clients by the agency. To do an analysis by
handicap, race, age, or sex, we must devise some means of allocating overhead costs
to each type of client. Two possible methods of allocation suggest themselves. First,
those "overhead" costs could be attributed on a per capita basis. This would be an
accurate approximation if these services (e.g., counseling and guidance) were inde-
dependent of the length and cost of the service program that is designed to help the
client. Another approach, and the one adopted for this analysis, is to allocate all
costs in proportion to the amount of cost of case services for the individual clients.
This implies that the types of clients who receive the most in case services, such as
medical treatment and training, also consume a higher proportionate share of coun-
seling and other expenditures. Because high service costs are likely to be associated
with the most difficult cases, such an allocation scheme is not unreasonable. Some
clients, however, have no "cost of case services," and are successfully rehabilitated
with, for example, only counseling and placement services from VR agency personnel.
The assumption of allocating all costs in relationship with case service costs
would imply that these types of clients were served at no cost. However, since those
who have zero cost of case service are only a small fraction of the total, and are
distributed across all handicap types, the resultant error is likely to be small.

Maintenance Cost. The cost of income maintenance payments is not counted
as a cost to society in the benefit-cost analysis. This stems from the fact that the cost
to the group that pays the income transfer payment is equal to the benefits that
accrue to the recipients of the income transfer payment; cost and benefits of the

23 Conley, The Economics of Vocational Rehabilitation, and idem, "A Benefit-Cost Analysis."
24 Called "Cost of Services" in the preceding section.
25 In 1970 the ratio of basic program costs to the cost of case services was approximately 1.78. See
Chapter 5 of R-1220-HEW for details of the components of each of these two types of cost.
transfer cancel each other out when society as a whole is considered. This is not to say that they are cancelled out if we are considering any group within society, such as taxpayers. In the case of taxpayers, income maintenance costs would be considered because most recipients of the income transfer payments are not representative taxpayers. Conley estimates that approximately 7 percent of the program cost goes for income maintenance. It was not possible to get a better estimate of the actual amount of program funds going for maintenance for hearing and vision handicapped youth. We therefore adopted Conley's figure.

Adjustment for Carryovers. The VR program has been growing steadily over the past decade. If the total annual expenditures were divided by the number of successful rehabilitations in a given year to obtain an average unit cost, the estimate would be biased upward because most clients are served more than one year. To adjust for this bias, Conley reduced the estimate of program cost by 2 percent. Our cost data are in a somewhat different form from Conley's. We have the cost of case services for all FY 1970 closures. Therefore, we do not have cost data on persons who entered the program but were not closed in 1970. However, the overhead rate used here would be biased upward slightly. Because of the growth in the program, a downward adjustment of 2 percent of the basic program cost is made.

Other-Party Costs. Some clients receive services that are not financed by the VR agency and hence do not show up in the budget of the agency or in the expenditure record of the client. Conley has estimated that such expenditures amounted to 4 percent of the annual program costs, and we use this estimate.

Repeater Costs. Some of the clients in the program have previously received service from the VR agencies. Others, especially youth, will receive additional service in the future. Conley argues that both these past and future costs should be included as part of the incremental social costs for the current year's rehabilitants. Since Conley's data indicated that 22 percent of the year's rehabilitants were or would become rehabilitation "repeaters," and assuming that future service costs are the same as the present average cost of rehabilitation, the program cost should be increased by approximately 22 percent to account for these "repeat" costs.

It is important to count program costs in benefit-cost analysis if in fact the benefits from these expenditures are also measured. It is not clear, from the methodology presented later for estimating benefits, that the benefits from past and future VR expenditures on a single client are incorporated into Conley's model. For example, past expenditures should be reflected in the income that the client has been receiving. Since the clients income upon entering the program is subtracted from his future income to obtain an estimate of net benefits, benefits flowing from past expenditures do not appear to be included in Conley's analysis. Conley's methodology on repeaters will be used in the base case.

Research, Training, and Construction Costs. This year's clients are also recipients of the benefits of previous research, staff training, and past expenditures on construction of facilities. These costs must be amortized to get an estimate of the program's true cost. Conley found that public expenditures for these categories were about 20 percent of the annual basic program cost, and that private support in these categories was about 5 percent of basic program cost. This meant that an estimate of the cost of research, training, and construction programs that could be allocated to this year's program would be equal to 25 percent of this year's basic program cost.

Opportunity Cost. One of the social costs of the VR program is the opportunity cost associated with the production that is lost when the client forgoes the labor force and enters the program. Conley estimates this production loss as equal to 35 percent of the first year's earnings of the successful rehabilitants after they leave the program. He estimates
forgone earnings [based] on the earnings reported by rehabiliants during the three months prior to acceptance (1962-64). These earnings averaged around 40 percent of those at closure, and given that it requires 85 percent of a year to complete rehabilitation, then forgone earnings would be equal to about 35 percent of estimated annual earnings at closure.26

Two features of this analysis appear questionable. First, he considers the forgone earnings only of those successfully rehabilitated. But unrehabilitated clients also had to forgo earnings—a small but real cost of the program that should be included. Second, since real data on earnings at acceptance were available, it would seem only reasonable to use those data instead of approximations. It is especially important to do so in our case because the ratio of the two earnings is not likely to hold constant among age groups. For totally blind or profoundly deaf youth, for example, this ratio is closer to 8 percent. Since the Conley methodology is being used in the base case, however, his methodology is adopted here and will be modified in the sensitivity analysis later in this section.

Benefits. We emphasize that the VR program produces several types of benefits for both the client and society. There are obvious psychic and other benefits to the client, notably self-sufficiency, but in this section we are concerned with the economic benefits that can be attributed to the services provided by the program.

Three major parameters must be specified to find the total increase in earnings from the VR program: the number of years the client will work, the differential in earnings for each year between what he earns after VR services and what he would have earned without them, and the discount rate. The specification or estimation of each parameter is discussed below.

Number of Years Worked. To estimate the number of years worked, Conley assumes that unless the rehabilitant suffers vocational failure or dies, he works until he retires at the age of 65. Conley’s mortality rates are taken from experience with Railroad Retirement Disability annuitants. This group has high mortality rates compared with the population in general. Conley makes this conservative assumption noting that this is the “worst possible” case for the VR program. If the VR program is cost-beneficial under this assumption, it is even more beneficial under less stringent assumptions.27 These mortality rates are very unrealistic for hearing and vision handicapped youth. Only 50 percent of those who are rehabilitated between the ages of 16 and 19 are assumed to live to be 40 years old. That figure soars to 96 percent if one uses 1959 mortality data for the general population.

A critical assumption concerns the amount of unemployment later in life. The number of years worked after rehabilitation and before reaching age 65 must be adjusted to reflect periods of possible unemployment. As described in the next section, Conley argues that the decrease in earnings due to unemployment is offset by the increase in productivity (as measured by earnings) of those who retain their employment.

Earnings Differential. Conley estimates the increase in productivity among successfully rehabilitated clients due to VR services as follows:

We will accept our conclusions from the follow-up studies that 80 percent of all rehabilitants are still gainfully employed five years after closure and that their average earnings are about 25 percent higher than the average earnings of rehabilitants in the year of closure, and we will further assume that these successful rehabilitants will continue to be employed at these higher

wages until death or retirement. Given these assumptions, it follows that the increase in earnings due to rehabilitation during any time period after rehabilitation will vary with the number of rehabilitants still employed (since the loss of earnings among live rehabilitants of working age who fail to maintain their employment is offset by the increased earnings of successful rehabilitants). Total increased output due to rehabilitants will, therefore, be equal to the average number of years worked by rehabilitants still employed five years after closure multiplied by the increase in earnings between acceptance and closure.28

A recent follow-up survey of 4146 VR service recipients in six states one, two, and three years after closure, conducted by National Analysts, Inc.,29 suggests that the assumption about the percentage working five years after closure is too high. Our later sensitivity analysis accordingly considers what the economic benefits would be if the figure were less. The National Analysts report indicates that in the 12 months following closure, 47 percent of the rehabilitants worked without interruption, 29 percent did not work at all, and 27 percent were working for pay when interviewed. Comparable figures for nonrehabilitants were 19 percent, 60 percent, and 24 percent, respectively. Over a 36-month period following closure, the percentage employed for pay at the time of the interview decreased only slightly, to 55 percent. The average amount of time worked for pay averaged just over 7 months per year, but varied from about 6 months per year up to 9 months per year depending on sex and race. However, rehabilitants under age 30 fared better; approximately 67 and 77 percent of females and males, respectively, were working for pay at the time of the interview.

The National Analysts study also presents new data on the percentage increase in earnings one, two, and three years after closure. In constant-value dollars, mean monthly earnings of 0- to 24-year-old rehabilitants increased about 25 to 35 percent for males and 20 to 30 percent for females. For rehabilitants of all ages at the end of one, two, and three years, earnings increased 30, 32, and 32 percent, respectively. However, even if Conley's assumption of a 25-percent increase in earnings over a five-year period after rehabilitation is accurate, it may not be appropriate to label this as a benefit of the VR program. Employer-conducted or on-the-job training, not the VR program, may have increased the skills of the rehabilitants after the time of closure.

A large possible error, however, is introduced if it is assumed that the increase in output is equal to the difference in earnings at acceptance and at closure for the youth. Although this may be a justifiable assumption for those who have already been in the labor force, it loses credibility for those who enter the VR program before entering the labor force and sometimes before leaving school, and therefore have no earnings at acceptance.30 It is difficult to believe that at least some of the less severely handicapped (e.g., those with 20/70 vision, or one good eye) could not qualify for jobs without VR training. Our doubts are strengthened by the National Analysts study, which found that 78 percent of the rehabilitants under age 30 thought they could have obtained their present positions without VR services.31 The sensitivity

30 Only 12 percent of hearing and vision handicapped youth under age 22 were reported as working at acceptance. Over 50 percent were students when they were accepted into the program.
of the effectiveness of this program to various estimated changes in earnings is examined later.

**Discounting.** The total stream of benefits can now be estimated by multiplying the number of man-years of life by the assumed increase in earnings due to the VR program for each type of handicapped client. Given a preference, however, one would prefer earnings this year to the same amount of earnings at some distant time in the future. To account for that preference, future benefits must be discounted. Just what is the proper amount to discount future costs and benefits from government projects has been subject to extensive study and controversy. Rather than choose a single discount rate, we will use 4 percent in our base case analysis and examine some other values in the later section devoted to sensitivity analysis.

**Benefit/Cost Analysis: Base Case**

For the base case analysis, we will use Conley's methodology and the data on hearing and vision handicapped youth derived from the FY 1970 case closures described earlier in this chapter. The next section will test the sensitivity of the analysis to various other assumptions.

The relative costs of services per rehabilitant are shown in Table 9.22 by the type and degree of hearing and vision handicap and by race and sex. The corresponding benefit/cost ratios are shown in Table 9.23.

Looking at the relative cost for the different types of handicaps, note that the legally blind youth have relatively high costs compared with those for the less severely visually handicapped and the hearing handicapped. Because earnings at referral and closure are fairly similar for youth with each of these types of handicaps, cost differences account primarily for differences in the benefit/cost ratios by type of sensorial handicap. The average benefit/cost ratio for all these youth is 10.8 using Conley's methodology. The benefits returned per dollar of cost go up as severity of handicap goes down: from 11.0 for deaf youth unable to talk to 12.3 for hard of hearing youth, and from 4.3 for totally blind youth to 13.6 for youth with one good eye. Thus, using Conley's methodology for this base case analysis, the VR program appears to yield high economic benefits to society in relation to the cost of the services.

The cost per rehabilitant is about the same for the entire group of hearing and vision handicapped youth and for females only. Thus, the lower benefit/cost ratios shown for females are due to a lower average improvement in earnings from time of referral to closure. Much of this discrepancy can be explained by the facts that a lower percentage of women who are rehabilitated enter the paid labor force, as compared with the total population, and those who do earn less than the total population, on the average. Over 87 percent of rehabilitants of both sexes were working in the competitive labor market at the time of closure, but only 78 percent of the female successes were classified as working in that market. The estimated average weekly earnings of female successes at closure was $13.70 less than the average for all hearing and vision handicapped youth rehabilitants.

It is seen that the average benefit/cost ratio for nonwhite youth is slightly higher than that for the total population. However, the costs of service to nonwhite youth were significantly lower, and average weekly earnings of nonwhite youth at the time of closure were also lower by $7.30.

In summary, although it is clear that some types of handicapped youth do better than others in a benefit/cost sense, the program appears to offer society a handsome return on investment regardless of the type or degree of hearing or vision handicapped youth. This is in line with previous findings. As we vary some of Conley's
assumptions, however, the success of the program appears to be somewhat less than the base case analysis indicates. We now turn to sensitivity analysis.

**Benefit/Cost Analysis: Sensitivity to Data and Assumptions**

This section explores the sensitivity of the conclusion that the VR program is highly cost-beneficial to those data and assumptions. Many different combinations of data and assumptions are possible. Our tactic here is to vary the most significant of them one at a time to isolate and study their influence, and then to make what appears to be a realistic set of changes of more than one type of data and assumption.

**Discount Rate.** The base case analysis used a discount rate of 4 percent. Its use assumes that the government or private enterprise does not have an investment
opportunity that yields over 4 percent. While it is impossible to say what the correct
discount rate is, since conditions in the future will change that rate, we can measure
the effects of various discount rates on our conclusions. Table 9.24 presents the
benefit/cost ratio associated with various discount rates from 4 to 10 percent. It is
seen that even for the relatively high discount rate of 10 percent, the program is still
returning positive benefits relative to its cost (i.e., the benefit/cost ratio is greater
than one) for all eight categories of handicapped youth studied.

Cost. Several of the data and assumptions about cost can be debated. However,
for any reasonable changes in the cost used, the conclusion that the program is
cost-beneficial does not change. For example, if the cost goes down, the benefit/cost
ratio goes up. On the other hand, if the cost goes up by, say, 25 percent, the benefit/
cost ratio is reduced by only 20 percent and is still high.

Number of Rehabilitants Who Continue To Work. The base case analysis
assumes an extremely high mortality rate for these youth and still shows the pro-
gram to be cost-beneficial. We will not use a still higher mortality rate because it
appears perhaps unreasonably high already. The base case analysis also assumes
that 80 percent of those with earnings at closure have earnings 5 years from closure,
and later earnings increases from employed rehabilitants offset later increases in
unemployment. If no change is made in the assumptions about the earnings of those
who remain employed, total benefits decline as the 80 percent employment figure
is lowered; the benefit/cost ratios in Table 9.25 are obtained for various assumptions
about the percentage that stays in the labor force after five years. As the table
indicates, the benefits exceed the cost (ratio exceeds 1.0) for even the most severely
handicapped youth, even if only 20 percent retain full-time employment. Since no
follow-up study on rehabilitants we are aware of has concluded that the rate of
employment after successful rehabilitation is that low, the VR program for sensori-
ally handicapped youth appears to be cost-beneficial for all reasonable values of
employment rate, if all other assumptions remain unchanged.

Earnings Gain Due To VR Services. A major assumption in the base case
analysis was that the earnings gain due to VR services was equal to the difference
between reported earnings at time of referral and at closure. However, the assump-
tion that earnings at referral were a good indication of what the client would
continue to earn in the absence of the VR program is open to serious question. It
is difficult to get an accurate estimate of what would happen to those clients if the
VR program did not exist since accurate data on earnings of hearing and vision
handicapped persons in the general population do not exist and because the VR
program clients probably are not typical of that population.

Rather than trying to get a more accurate estimate of earnings without VR
services, we use several different earnings assumptions to get an idea of their effects
on the base case analysis benefits. Table 9.26 shows the benefit/cost ratio of the VR
program under four different assumptions about earnings without services. It is
assumed that 25, 50, 75, and 100 percent of those cases closed as successes would
have been employed, with the average earnings equal to the 1970 minimum wage,
in the absence of VR services (i.e., a minimal $64 a week on the average).

According to the table, even if 100 percent of the rehabilitants could obtain
minimum wage jobs on the average without training, the program would be slightly
cost-beneficial for the entire client population of hearing and vision handicapped
youth, but would not be cost-beneficial for profoundly deaf or legally blind youth.
(Where the benefit/cost ratio shown is negative, the VR program is less effective in
earnings terms than a program that puts 100 percent of the rehabilitants in mini-
uum wage jobs.)

Within all the categories from the more severely to the less severely disabled,
Table 9.24
VR BENEFIT/COST RATIO BY TYPE OF HEARING AND VISION HANDICAPPED YOUTH: SENSITIVITY TO DISCOUNT RATE

<table>
<thead>
<tr>
<th>Type and Degree of Sensory Handicap</th>
<th>Benefit/Cost Ratio with Discount Rate of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4%</td>
</tr>
<tr>
<td>Blind</td>
<td></td>
</tr>
<tr>
<td>Partially sighted--legally blind</td>
<td>4.3</td>
</tr>
<tr>
<td>Partially sighted--20/70</td>
<td></td>
</tr>
<tr>
<td>Partially sighted--20/200 acuity</td>
<td>10.5</td>
</tr>
<tr>
<td>One good eye</td>
<td>13.6</td>
</tr>
<tr>
<td>Other visual impairment</td>
<td>13.5</td>
</tr>
<tr>
<td>Deaf, unable to talk</td>
<td>11.0</td>
</tr>
<tr>
<td>Deaf, able to talk</td>
<td>11.4</td>
</tr>
<tr>
<td>Other hearing impairment</td>
<td>12.3</td>
</tr>
<tr>
<td>All types combined</td>
<td>10.8</td>
</tr>
</tbody>
</table>

Table 9.25
VR BENEFIT/COST RATIO BY TYPE OF HEARING AND VISION HANDICAPPED YOUTH: SENSITIVITY TO RATE OF EMPLOYMENT

<table>
<thead>
<tr>
<th>Type and Degree of Sensory Handicap</th>
<th>Benefit/Cost Ratio with Employment Rate After 5 Years of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80%</td>
</tr>
<tr>
<td>Blind</td>
<td></td>
</tr>
<tr>
<td>Partially sighted--legally blind</td>
<td>4.3</td>
</tr>
<tr>
<td>Partially sighted--20/70</td>
<td>5.5</td>
</tr>
<tr>
<td>Partially sighted--20/200 acuity</td>
<td>10.4</td>
</tr>
<tr>
<td>One good eye</td>
<td>13.6</td>
</tr>
<tr>
<td>Other visual impairment</td>
<td>13.5</td>
</tr>
<tr>
<td>Deaf, unable to talk</td>
<td>11.0</td>
</tr>
<tr>
<td>Deaf, able to talk</td>
<td>11.4</td>
</tr>
<tr>
<td>Other hearing impairment</td>
<td>12.3</td>
</tr>
<tr>
<td>All types combined</td>
<td>10.8</td>
</tr>
</tbody>
</table>

The VR program has economic benefits that exceed its costs even if 75 percent or less earn the minimum wage in the absence of the program.

In the base case analysis that took earnings at time of acceptance as a measure of income in the absence of the program, the benefit/cost ratio for the category of youth with one good eye was some 3 times larger than that for totally blind youth, for example. The practice of "creaming" and serving the least handicapped youth under the base case analysis assumptions would lead to the largest economic return. More realistic assumptions about the inherent earning capacity of each type of handicapped youth, however, calls into question whether emphasizing service to less
Table 9.26

VR benefit/cost ratio by type of hearing and vision handicapped youth: sensitivity to assumptions about earnings without VR services

<table>
<thead>
<tr>
<th>Type and Degree of Sensorial Handicap</th>
<th>Benefit/Cost Ratio with Indicated Percentage Employed at an Average of the Minimum Wage Without VR Services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25%</td>
</tr>
<tr>
<td>Blind</td>
<td>3.6</td>
</tr>
<tr>
<td>Partially sighted—legally blind</td>
<td>4.6</td>
</tr>
<tr>
<td>Partially sighted—20/70, up to 20/200 acuity</td>
<td>9.2</td>
</tr>
<tr>
<td>One good eye</td>
<td>12.8</td>
</tr>
<tr>
<td>Other visual impairment</td>
<td>12.2</td>
</tr>
<tr>
<td>Deaf, unable to talk</td>
<td>8.8</td>
</tr>
<tr>
<td>Deaf, able to talk</td>
<td>9.7</td>
</tr>
<tr>
<td>Other hearing impairment</td>
<td>10.7</td>
</tr>
<tr>
<td>All types combined</td>
<td>9.4</td>
</tr>
</tbody>
</table>

handicapped clients is in fact a rational, to say nothing about equitable, policy from the standpoint of economic return.

**Benefit/Cost Analysis: Conservative Assumptions Case**

In the preceding section, several of the base case analysis assumptions were varied individually and the conclusion that the program is cost-beneficial in an economic sense did not change. In this section, we shall change three of the most significant base case assumptions and recalculate the benefit/cost ratios for this new set of data and assumptions, which we consider to be more conservative than the base case data and assumptions. If the VR program still appears cost-beneficial even under these rather conservative assumptions that should show the program in the worst reasonable light, we will conclude that the program is effective in a social cost-benefit sense.

In calculating the benefit-cost ratios shown in Table 9.27, we assume the following:

- The discount rate is 8 percent.
- Only 50 percent of the legally blind and deaf youth, and only 70 percent of the less severely handicapped youth, are employed 5 years after closure.
- In the absence of the VR program, 50 percent of both the legally blind and the deaf rehabilitants and 75 percent of the less severely handicapped youth rehabilitants, could have been employed earning the minimum wage on the average.

We emphasize that the true value of the above figures is not known. The values shown are not our best estimates of what those true values are, but rather are conservative estimates made to put the VR program to a hard test. Rather than assume, as in the base case analysis, that without the VR program nearly all of these youth would be unemployed throughout their lives, we assume a majority of them
would be employed. And rather than assume a 20 percent unemployment rate for successful rehabilitants after five years, we assume a 30 to 50 percent unemployment rate.

Under these much less favorable assumptions, the program still appears to have economic benefits that exceed its costs to society for all eight categories of hearing and vision handicapped youth. Although these benefit/cost ratios are all greater than one, they are close to one for the legally blind.

Many questions about the proper allocation of resources among handicaps remain unanswered. However, the positive quality-of-life benefits of the program coupled with favorable average economic benefits in relation to cost, imply that expansion of the VR program could have very desirable effects. If the program were expanded, however, it should be carefully and periodically reevaluated, because diminishing returns on investment can be anticipated as a larger fraction of the handicapped population is served, and because our calculations have been of average costs and benefits, not the marginal costs and benefits of program expansion, for which data are not available.

Benefits and Costs to the Taxpayers

The previous analysis examined the VR program from the standpoint of society as a whole. The question of just who received the benefits and who paid the costs within society was not considered. In this section we view the VR program from the perspective of an investment decision for the taxpaying segment of society.

The costs borne and benefits captured by the taxpayer are different from those discussed in the previous sections. On the cost side, income maintenance payments during rehabilitation are a real cost to the taxpayer while the opportunity cost of withdrawing the client from the labor force, and other-party payments, are not. On the benefit side, only the increment in taxes paid by the employed handicapped youth, rather than the total increase in income, is counted as a benefit to the taxpayer. An additional benefit is the reduction in future welfare payments that is attributable to the VR program. The costs can be calculated from information presented previously; they are $29.5 million for VR clients whose cases were closed in FY 1970.

<table>
<thead>
<tr>
<th>Type and Degree of Sensorial Handicap</th>
<th>Benefit/Cost Ratio for Total Youth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blind</td>
<td>1.1</td>
</tr>
<tr>
<td>Partially sighted—legally blind</td>
<td>1.4</td>
</tr>
<tr>
<td>Partially sighted—20/70 up to 20/200 acuity</td>
<td>2.7</td>
</tr>
<tr>
<td>One good eye</td>
<td>4.4</td>
</tr>
<tr>
<td>Other visual impairment</td>
<td>3.5</td>
</tr>
<tr>
<td>Deaf, unable to talk</td>
<td>2.5</td>
</tr>
<tr>
<td>Deaf, able to talk</td>
<td>3.0</td>
</tr>
<tr>
<td>Other hearing impairment</td>
<td>2.6</td>
</tr>
</tbody>
</table>
To estimate the increase in taxes paid by rehabilitants, it is necessary to estimate their income distribution. From the RSA-300 forms, the number of persons in weekly income ranges from $0 to $20, $21 to $40, $41 to $60, $61 to $100, $101 to $150, and over $150 was calculated for each type of sensorially handicapped youth. It was assumed that each person earned the average salary within his weekly income range except for the over $150 category, where average earnings were taken to be $160. The estimated tax was calculated assuming that the young handicapped taxpayer had no other dependents than himself. This may introduce a small upward bias in the benefits that are captured by the general taxing population. The estimated federal income taxes paid by rehabilitants in 1970 and the discounted (4 percent) federal tax payments over the lives of the rehabilitants are estimated to be $4.7 million and $57.1 million, respectively, assuming the total federal tax payments will be the same each year for the whole group of rehabilitants.

We are now faced with the problem of estimating the taxes paid in the absence of the VR program. If earnings at acceptance are used as the tax base, the taxes paid would be negligible. If different assumptions about the percentage that could earn the minimum wage were made, the net increase in taxes paid by the rehabilitants would be substantially different, as shown in Table 9.28.

<table>
<thead>
<tr>
<th>Assumed Percentage Employed Earning Minimum Wage in Absence of VR Program</th>
<th>Net Increase in Federal Taxes</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>$57.1</td>
</tr>
<tr>
<td>25</td>
<td>46.3</td>
</tr>
<tr>
<td>50</td>
<td>35.5</td>
</tr>
<tr>
<td>75</td>
<td>24.8</td>
</tr>
<tr>
<td>100</td>
<td>14.0</td>
</tr>
</tbody>
</table>

These estimates of tax benefits are lower than Conley’s. The major reason for the difference is that Conley assumes that federal tax payments account for only half of the tax liability of the handicapped person. It is difficult to estimate the incidence of the sales tax and property tax on the poor and handicapped. If the client were truly impoverished, he would probably qualify for public assistance and might receive an income comparable to what many of the successful rehabilitants earn. Thus the property tax and sales tax payments could be approximately the same with or without the VR program for some, but not all, youth. By not counting sales and property tax benefits, we will be underestimating total tax benefits. However, the state income tax should be added into the benefits. Revenue from state income tax was 10 percent of federal revenues from the personal income tax.  

By placing clients in jobs, the VR program reduces the number of handicapped youth who need to rely on public welfare and thus benefits the general taxpayer population. The problems in estimating this reduction are as difficult as estimating increases in earnings. Conley uses welfare payments at acceptance and at closure as a measure of the difference in the amount of welfare payments over the life of the client. This methodology is not directly applicable to youth because many of the handicapped youth are supported by their parents at referral but would have needed welfare later. Therefore, before-and-after welfare payments may not accurately reflect what the client would cost the taxpayer. In the absence of better data, our approach here is to take the average reduction in welfare payments per rehabilitant of any age and assume it is applicable to the youth population under study.

In 1970 there were 266,975 rehabilitants. At referral only 28,308 were receiving public assistance. At closure, this number was reduced to 16,589. The average monthly amount of public assistance dropped from $3.53 million to $1.87 million, or a net reduction of $1.66 million. This works out to a reduction of about $70 per rehabilitant per year in the aggregate amount of welfare payments. Discounting this reduction over the life of the rehabilitants, the lifetime benefit for hearing and vision handicapped youth would be $8.4 million.

The benefit/cost ratios for the general taxpayer population are shown in Table 9.29 for several different assumptions about what the client could earn in the absence of the VR program. The welfare reduction benefit has been decreased in proportion to the increase in the percentage employed.

Note that from the viewpoint of the general taxpaying population, the VR program for hearing and vision handicapped youth has benefits that exceed its costs if we assume that 75 percent or less of these rehabilitants are employed at the minimum wage, on the average, in the absence of the VR program. Because we have excluded all sales and property tax benefits, and thus the benefits were underestimated, the program appears cost-beneficial as a taxpayer "investment," just as it was shown to be cost-beneficial from the viewpoint of society as a whole and is cost-beneficial from the viewpoint of the individual VR client.

<table>
<thead>
<tr>
<th>Assumed Percent Employed</th>
<th>0%</th>
<th>25%</th>
<th>50%</th>
<th>75%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earning the Minimum Wage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>in Absence of VR Program</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benefit/cost ratio</td>
<td>2.4</td>
<td>1.9</td>
<td>1.5</td>
<td>1.0</td>
<td>0.5</td>
</tr>
</tbody>
</table>

**NEEDED IMPROVEMENTS IN VOCATIONAL SERVICE PROGRAMS**

Improvements needed in the delivery of vocational services to hearing and vision handicapped youth are discussed here; our recommendations appear in italics. Potential federal roles in bringing about these improvements are presented in Chapter 2.
Expand the Vocational Rehabilitation program to serve a larger fraction of the hearing and vision handicapped youth population. This program not only improves the quality of life of youth served by increasing their ability to function more independently, to obtain employment, and to work at higher quality employment, but it also appears to yield economic benefits (reduced service cost later in life, reduced welfare, increased taxes paid, and increased earnings) that exceed the costs of the program. Even with assumptions designed to subject the program to a difficult test, the economic benefits exceed costs to a society as a whole and to the taxpaying population for every one of the eight categories of type and severity of hearing and vision handicap that we considered. Insufficiency of funds was the problem most often cited by VR agency administrators we surveyed in the 50 states. A recent General Accounting Office report on the VR program indicated that "the number of persons needing vocational rehabilitation services has far exceeded the number of persons that have been served under the program" and that "the number of persons rehabilitated annually, although increasing, is still not as great as RSA's estimates of the number becoming eligible each year." The need for additional facilities is also large.

Establish clear guidelines on the categories of handicapped persons to be given priority in the receipt of Vocational Rehabilitation services, and restructure existing incentives so that those categories are given priority, including abolition of the simplistic use and reporting of successful case closures. One might assign highest value to serving those with the severest handicaps (as the Rehabilitation Act of 1973 does) or to young persons, unemployed persons, persons who show promise of yielding high economic benefits in relation to cost, etc. One might take a dynamic and flexible approach depending on the level of vocational impairment. For example, "normal" youth might receive no special vocational services unless they are unemployed after leaving school, in which case the State Employment Service could give them job information. All handicapped youth might be screened before leaving school, and mildly sensorially handicapped youth might automatically be given both job information and placement assistance upon leaving school, and then if they are not vocationally successful, full VR services could be given. And severely sensorially handicapped youth could be automatically offered VR services beginning well before their scheduled departure from school. Whatever the priorities assigned, the program will come closer to meeting its goals with its available resources if effort is concentrated on finding, accepting, and serving clients in priority categories. Even before passage of the new Act, we seriously question whether the VR program legislators and administrators really intended that 69 percent of the young visually impaired clients should be drawn from the categories "one good eye" and "other visual impairment" rather than from the more severely handicapped "partially sighted" and "blind" categories. For visual types of impairment, the charge that some VR counselors inflate their success statistics by "creaming" and selecting easy-to-serve clients appears to be true. To best satisfy the intent of the Rehabilitation Act of 1973—that the most severely handicapped persons be served first—much better definitions and reporting, including disaggregation within each type of handicap by degree of severity, are needed.

At present, one major way in which the system judges and reportedly rewards its personnel is based on total successful closures and the percentage of successful

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33 See R-1220-HEW, p. 82.
34 Effectiveness of Vocational Rehabilitation in Helping the Handicapped, Report to Congress by the Comptroller General of the United States, Number B-164031 (3), April 3, 1973.
35 R-1220-HEW, p. 85.
closures in relation to clients served. The use of gross numbers of successful closures provides disincentives to serving hard-to-rehabilitate clients, disincentives to an individual VR counselor's conserving on program costs, disincentives to offering a wide choice of occupations to clients, and disincentives to train for more than minimal pay and skill occupations. The much discussed, but as yet unimplemented, concept of disaggregating the clients served by degree of difficulty of rehabilitation and type or quality of "gainful employment" obtained is a good one. Either a set of measures of "effect" of each counselor and VR agency, or a weighted measure giving higher value to higher priority types of results, would be a major improvement over the present simplistic measure with its inherent disincentives to desired performance.\textsuperscript{36}

Conduct thorough evaluations of state programs that have significantly better than average gainful employment, occupational, and earnings results for handicapped youth, to determine desirable characteristics of those programs that may be exportable to other states. The reasons for low average earnings of successful VR clients, despite extensive and costly services, and the often-heard complaint about the narrow range of occupational choices offered clients, should be investigated more vigorously than they are now so that this dual problem at least can be alleviated. The current programs in the 50 states are natural "experiments" in alternative methods of serving these youth; they represent a wealth of relatively untapped data that should shed light on program effectiveness as a function of the type and quantity of services provided, expenditures, means of providing the service, type of handicapped youth, and so forth. The current system of reporting on individual clients is the most comprehensive of any we observed in federal programs, but it still has some deficiencies. For example, some of its categories of reasons for rejections or failure to rehabilitate a client are not very illuminating, and it does not adequately mine the wealth of its own data as a means of discovering and evaluating problems and options for program improvement.

Increase the number and improve the geographic distribution of specialists in vocational services to hearing and vision handicapped persons. Special expertise is needed in serving both of these categories of handicapped persons; the need is especially critical for profoundly deaf clients with little or no oral communication skill.\textsuperscript{37} Most states now have such specialists, but care should be taken that they are available at least in every major metropolitan region. This holds for both the Vocational Rehabilitation program and the State Employment Service program.

Increase the coordination between Vocational Education, Vocational Rehabilitation, and State Employment Service programs, and establish a mechanism for outreach to all hearing and vision handicapped youth in their latter school years, with follow-up after the time of leaving school. In our interviews with various of these agencies in five states, coordination varied from excellent to practically nonexistent. By and large, however, it appeared that these three programs operate fairly independently of one another at the client level, although they have very closely related purposes and often have "coordinating committees" at the agency manage-


ment level. They also tend to serve clients that come to them; rather than setting out well-defined priority categories of youth who need service and then reaching out to find those youth. It would be inexpensive to arrange for automatic referral to or outreach by VR, for example, for all hearing and vision handicapped youth, both in school and applying for State Employment Service assistance. Such a stratagem would provide VR with fairly comprehensive rolls of potential clients from which they could select high-priority types of youth. The precedent is the referral program for disabled welfare clients.

One possible follow-up mechanism not now used is to monitor former clients' earnings through Social Security records.

Modify the State Employment Service program to provide more trained specialists in the placement of hearing and vision handicapped persons, and give those specialists a caseload well below that of current SES personnel. The current workload of SES personnel is so heavy that it appears very difficult for them to provide meaningful job information to handicapped persons, let alone placement service. In addition, the current information systems used in the states are improving but still leave much to be desired in matching handicapped clients with available jobs.

38 The Vocational Education Act Amendments of 1968 require cooperative arrangements between Vocational Rehabilitation and Vocational Education agencies, and the Rehabilitation Act of 1973 (P.L. 93-112) requires that state VR annual plans provide for intergovernmental cooperative arrangements.
Chapter 10

INCOME MAINTENANCE

INTRODUCTION

This chapter discusses programs that provide direct financial aid to a handicapped youth or his family, principally in the form of cash transfers rather than in-kind aid such as in the Food Stamp program. The chapter briefly summarizes current financial assistance programs, describes the nature of expenditures for various types of services needed by handicapped youth, and presents recommendations for improvement. Earlier chapters have discussed human resources development programs that contribute to economic security, such as education and vocational rehabilitation, and programs that provide services to the family instead of cash transfers.

CURRENT INCOME MAINTENANCE PROGRAMS

In 1970, welfare agencies spent some $635 million to aid about one million physically and mentally handicapped youth. Of this amount, about $18 million and $25 million, respectively, went for assistance to vision and hearing handicapped youth. The federal, state, and local shares were 54.6, 34.6, and 10.8 percent.

The four primary programs serving physically and mentally handicapped youth are Social Security Disability Insurance (SSDI); Supplemental Security Income (SSI) providing aid to the aged, blind, and disabled; Aid to Families with Dependent Children (AFDC); and Income Tax Exemption for the Blind (ITEB). The estimated numbers of physically and mentally handicapped youth served by these programs in 1970 are: SSDI, 14,700; AB, 4000; APTD, 29,000; AFDC, 976,000; and ITEB, 9000. The average yearly expenditure per youth served is about $635.

Prior to the Social Security Amendments of 1972, most youth given aid were eligible not because of their handicaps, but because they were part of a family receiving Aid to Families with Dependent Children, and the AFDC program does not make allowance for the added expense of the handicapped child. The 1972 amendments permit youth from needy families to draw significantly increased aid based on the existence of a handicap, under the new combined Supplemental Security Income program providing aid to the aged, blind, and disabled. The SSI does not have the age restrictions of the former Aid to the Blind (which in most states did not serve persons less than 16 or 18 years old) and Aid to the Permanently and Totally Disabled programs (which did not serve anyone less than 18 years old).

The federal government uses two primary functional mechanisms in this program area: direct provision of assistance in the SSDI and SSI programs, and funding of assistance through state and local agencies in the large AFDC program. Federal involvement in financial assistance has grown to the point where the majority of the

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1 For a more detailed description of these programs, as they relate to handicapped youth, see Chapter 7 of Rand Report R-1220-HEW.

2 SSI replaces two programs that provided financial aid to handicapped youth: Aid to the Blind (AB) and Aid to the Permanently and Totally Disabled (APTD).
funds expended on needy handicapped youth are federal, and three of the five major programs are federally operated. This dominant federal role apparently evolved for two main reasons: (1) state, local, and private sources have had insufficient financial resources to provide socially desirable minimum income levels to an acceptable fraction of the needy population; and (2) under state and locally operated programs, there has been a socially undesirable inequity in the distribution of funds across states. While authorities disagree on what level of financial aid is adequate, and what distribution of funds is equitable, the President's Commission on Income Maintenance Programs concluded that existing aid levels were inadequate and that the distribution of aid was inequitable. In brief, the federal government acquired its present role because it had both the funds and the inclination to distribute them to the needy population across states more equitably and to raise the payments to a more nearly adequate level. Although their roles have gradually diminished, both state and local governments are still very much involved; they supply nearly half the funds expended for needy handicapped youth, and operate the AFDC program.

The Federal Social Security Insurance Program is based on a social insurance model wherein an employee and his employer, and self-employed persons, contribute to the system to provide coverage against disruption or reduction of the worker's income due to disability, death, or retirement. Payment levels are not based primarily on need, but on the rate and number of quarter-years of previous contribution to the system, subject to maximums and minimums. Under the Childhood Disability provisions of this program, a person aged 18 or older who has been disabled prior to his twenty-second birthday, and who is the child or grandchild of a retired or disabled worker, could receive payments of up to $166 a month beginning September 1972, while the disabled child or grandchild or a deceased worker could receive up to $256.90 beginning September 1972 if he earns $125 or less per month. Because most handicapped youth under 22 have neither accumulated the required previous earnings record, nor have a retired, disabled, or deceased parent, only a small fraction actually receive benefits, averaging about $62 a month, from this program. The breakdown by type of handicap is approximately 1 percent visual and 2 percent hearing impaired.

Prior to 1972, the AB and APTD public assistance programs were operated within the states and jointly funded by federal and state governments. The Social Security Act of 1972 combined these two programs with Old Age Assistance (OAA); the new combined program will be federally-funded and operated, effective in 1974. The new program, called Supplemental Security Income (SSI), established uniform basic payment levels for recipients in all 50 states and the District of Columbia. (Individual states may supplement these federal payments, which could take into account the variations from state to state in the cost of living.) Eligibility requirements, which previously varied from state to state, are also uniform for new applicants. Persons of any age can be eligible, and those 65 years or older need not be blind or disabled. Thus, the new SSI program alleviates many past inequities in payment levels and eligibility requirements which varied from state to state.

Under a state plan in effect as of October 1972, people on the APTD rolls for December 1973 and for at least one month prior to July of 1973 were considered disabled for purposes of the new program, and were considered to meet the resource requirements of the new program. These same provisions apply to people on AB, except that they need not have been on the rolls for at least one month prior to July 1973. These persons were transferred to the SSI rolls on January 1, 1974 if they also

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met the other requirements of Title XVI, such as income, age, relationship, and the like. A "blind" applicant, however, who is engaged in employment may exclude his working expenses from his earned income. New applicants must meet all requirements of the new program. For a disabled applicant to qualify for payments under the new program, based upon a disability other than visual, he must meet the income and resources test and be unable to engage in any substantial gainful activity by reason of a medically determinable physical or mental impairment that either can be expected to result in death, or has lasted (or can be expected to last) for a continuous period of not less than 12 months. A child's income and resources include those of his parents or his parent's spouse, if his parent or parent's spouse lives with him, whether or not they are available to him, except to the extent "determined to be inequitable." "Blind" applicants must meet the income and resources test and must have central visual acuity of 20/200 or less in the better eye with the use of a correcting lens, or restriction of visual field to 20° or less. Ability to engage in a substantial gainful activity is not a factor in determining eligibility for the blind.

One question to be asked is why, if blind, one must be blind and needy to qualify, whereas, if disabled, one must be disabled, needy, and unable to work.

As amended by P.L. 93-233, payments for an eligible person who does not have an eligible spouse were set at the rate of $140 per month beginning in January 1974, reduced by the amount of the individual's countable income. Payments for an eligible person who has an eligible spouse will be at the rate of $210 per month in January 1974, reduced by the amount of the person's countable income (combined with that of his or her spouse). P.L. 93-233 will also raise these figures to $146 and $219, respectively, effective July 1974. These payment levels are higher than the old program payment levels in most states, and any state may supplement the federal payment level if it wishes to. However, the level of payment above the federal minimum to people on the state rolls in December 1973 must be maintained in order to get matching federal funds for Medicaid.

Under the pre-1972 AB program, the average monthly grant ranged from $59 in one state to $177 in another, with a United States average of $104. Coupled with varying payment levels were varying AB eligibility standards by age (5 years in one state, 15 years in many others), by whether or not property liens were required, and by the allowable value of home and personal possessions. Five percent of all AB clients were under 22. We estimated that in 1970, there were 4076 recipients under 22, upon whom a total of $5,550,000 was expended. The annualized expenditures per recipient varied across the states from $714 to $2058 and averaged $1372. The number of recipients per 100,000 state population aged 0 to 21 varied from 0.5 to 19. The fraction of total program expenses devoted to administration, service, and training rather than financial assistance varied across states from 5 to 32 percent.

The APTD program had a U.S. average monthly recipient grant of $97 in 1970. Total annual expenditures per recipient averaged $1229, but varied across states from $724 to $1837. A total of 29,000 physically and mentally handicapped persons aged 22 or less that year received APTD, or 3.4 percent of all APTD recipients. Age requirements were uniform across states at 18 years, but other eligibility requirements varied markedly. The number of recipients aged 18 to 21 per 100,000 state population averaged 205, but ranged from 27 to 625. Perhaps the most graphic example of the inequity of the payments distribution is the fact that nearly half of all APTD payments to recipients under 22 in 1970 were paid in California.

In an effort to better understand the variations across states in AB and APTD assistance to handicapped persons, we investigated the relationships between factors such as federal funding to the state for these programs, state expenditures for these programs, the number of aid recipients and the number of handicapped per-
sons in the state, total state revenues, and personal income levels. (Appendix B summarizes our efforts and presents a review of other previous studies in this area.) We had limited success in "explaining" the variation across states, and conclude that the determinants of state and federal expenditures for financial assistance to handicapped persons are probably too complex to be understood using currently available data and econometric models with simultaneous equations.

The AFDC program provides financial assistance to needy families with children, but to handicapped children only if they belong to families receiving AFDC. In March 1971, the average monthly payment was only $49.60 per recipient person. However, the program is so large that an estimated $580,868,000 was expended on 975,920 handicapped youth in 1970. This is by far the most massive financial assistance program serving handicapped youth, and an excellent contact point for identifying those who need nonfinancial types of assistance. As we indicated in Chapter 4, progress in AFDC in implementing a mandated screening program has been slow.

The legally blind are the only handicapped persons allowed to claim an additional exemption from federal income taxes. The exemption may be claimed for a taxpayer or for his spouse but not for other dependents; parents cannot claim an extra exemption for handicapped children. At a marginal tax rate of 20 percent, the $750 exemption means a tax reduction of $150 per person. This is, in effect, a financial assistance payment to the legally blind person.

In our survey of state welfare agencies, problems cited in the present system included lack of financial support for the programs and inadequate coordination of services.

FINANCIAL AID AND THE NATURE OF EXPENDITURES FOR HANDICAPPED YOUTH

In considering an income maintenance program for handicapped persons, and in considering the issue of whether to provide funds directly to the families or indirectly through payments to service providers, one must examine the nature of the services and expenditures needed by the handicapped person. Several types of service expenditures are discussed below.

Prevention. By definition, expenditures for prevention cannot be part of an income maintenance program for handicapped persons. Payments could be provided for preventive medical care in health programs (e.g., as a vaccination program or as a mandatorily covered expense under health insurance), and some small portion of public assistance payments to families about to have a child or that have children who are not physically or mentally handicapped, can be considered as prevention expenditures because of the known linkage between nutrition, for example, and handicapping conditions.

Identification. Also by definition, identification cannot be funded as income maintenance for handicapped persons, but is a necessary predecessor of that income maintenance.

Direction. Direction is an information-based service that depends on a steady flow of funds to enable the regular collection and updating of information, coordination with other service agencies in providing an appropriate mix of services to a child, and adequate follow-up for the children. Since, in general, this service is not

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4 The 1972 marginal tax rate for a married person filing jointly with a taxable income of $4000 to $6000 was 19 percent, while the comparable rate for a single person earning $4000 to $6000 was 21 percent.
provided well now, since no agency such as the Regional Direction Centers we propose in Chapter 3 exists in most areas, and since current direction expenditures are a hidden implicit portion of expenditures for other services such as medical care, education, welfare, and rehabilitation, it does not appear practical to provide funds directly to families for purchase of direction services.

**Counseling.** The need for counseling is highly variable, and counseling is often provided as part of a package of services from a service agency. If funds are provided directly to a family for purchase of counseling, the amount should be determined on an individual need basis and reassessed periodically.

**Medical Treatment.** With the extremely high variance over time of medical expenditures for a handicapped child, it is highly impractical to expect a family to pay all their medical bills from a fixed level of income maintenance. Some sort of health care program appears essential, although the forms it might take cover a wide range, including the present Crippled Children's Service program and the proposed National Health Insurance. A family in financial need could be given the insurance or other health care program service or, through regulations on the receipt of income maintenance, the family might be required to purchase health insurance of an approved type and be expected to pay for a small portion of the general medical expenses. If an insurance mechanism is adopted, however, we recommend not applying such a "deductible" to insurance payments for services directly related to the handicap, such as screening and diagnostics, medical or surgical treatment of the handicapping condition, and provision of sensory aids. Applying a "deductible" to those types of services could result in the child's being denied essential services, while yielding relatively little monetary savings.

**Education.** Current practice is to provide funds for special education to the education agency directly rather than to the families. One practice in very limited use is to give the family a special education "voucher," whereby special education services unavailable locally can be obtained from a school in another region or another state.

**Vocational and Special Training, and Job Placement.** The need for these services is also highly variable among handicapped youth and over time. Consequently, if funds are provided directly to families for purchase of these services, the amount should be determined on an individual need basis.

**Sensory Aids.** While the need for one or more sensory aids by hearing and vision handicapped youth is nearly universal, the original costs and time intervals between replacement of personal aids is not constant. Consequently, here again, if funds are to be provided directly to the family for purchase of the aids, the amount of those funds should depend upon the individual degree of handicap and expected life of the aid.

**Transportation.** For handicapped youth and, in certain cases, for the escorting family member, special transportation needs will arise primarily in conjunction with obtaining some other service such as special education, medical treatment, or some types of special training. Since the added costs of transportation depend on how often those other services are needed and how far it is from the child's residence to service facilities, transportation costs are not uniform and are better handled for financially needy families as part of the costs for those other services—that is, as a segment of the special education budget and as a covered expense under a health care funding program, rather than as a fixed income supplement.

These expenses could also be included as a variable component of an income maintenance program, with the payment determined separately for each individual and with required certification of receipt of other services to which the child must travel.
Necessities of Daily Living. Historically, income maintenance of a fixed amount each month has been provided to help financially needy families to purchase housing, clothing, food, and other goods and services needed by both handicapped and nonhandicapped persons in daily living. The amount a family needs for these types of expenditures for their handicapped child may be slightly higher than that needed for a "normal" child. However, reliable data on the degree of additional need are not available.

NEEDED IMPROVEMENT IN INCOME MAINTENANCE PROGRAMS

Improvements needed in the provision of financial assistance to hearing and vision handicapped youth are discussed in this section; our recommendations appear in italics.\(^5\)

Undertake research and evaluation to obtain much better planning information on the financial needs of handicapped persons. Data on what these programs are accomplishing with respect to handicapped persons are woefully inadequate. Decisions on levels of financial assistance to the handicapped person and his family must be based upon very little information in two essential areas: what the extra financial needs of various groups of handicapped persons are, and what different levels of support to the handicapped person mean in terms of the total quantity and quality of goods and services that can be purchased with the assistance.\(^4\) The lack of data is a severe impediment to making informed decisions on "need" and "adequate" levels of income assistance. Although many authorities believe the present payment levels are inadequate, they have neither agreed upon definitions of adequacy and payment levels necessary to provide a socially acceptable standard of living, nor studied them in the depth warranted by the importance of the topic. Further, the newly implemented SSI program, with its new regulations, needs careful evaluation to see if it is functioning as intended, and how well it is functioning.

Limit direct cash transfers to handicapped youth and their families, in lieu of other mechanisms of making service available, to coverage of normal daily living expenses and to relatively minor special service expenses. This chapter earlier covered the point that, with the major exception of expenditures for daily living, such as for food, housing, and clothing, each of the other major services involves either: (1) expenditures before the child is handicapped or known to be handicapped, in which


\(^4\) While this is a major problem for many groups, it was cited as especially critical for handicapped persons by the Commissioner and several other high-level personnel in HEW's Assistance Payments Administration, in our interviews with them in March 1972.
case the family, by definition, cannot be given dollars in lieu of services; or (2) highly variable and often unpredictable levels of expenses that are not uniform over time and that depend upon the specific needs of the individual handicapped child. In the latter case, the financially needy family could be given an income supplement to cover the cost of the special services. It is desirable, however, to avoid expenditures on families who do not need special services in a given time period, to avoid the possibility that the family will not save the extra funds for the child’s future needs, and to avoid the possibility that service needs will exceed the amount of money the family could save from an income supplement. We therefore believe that if funds are to be given to a family for purchase of major goods and services other than those that nonhandicapped persons need for daily living, then it is essential to base the amount of those funds on the handicapped child’s periodically assessed need for services. Further, since the child is the one who needs the special service, but is not necessarily the one who decides how the family will spend the money, we believe it highly desirable to protect both the child’s rights and society’s investment by requiring that any major special income supplements, above income maintenance levels for daily living, be expendable only for meeting the child’s specific needs.

If these are to be the procedures, however, there appears to be no persuasive reason for funneled through the family rather than directly to the service providers; giving the money to the family does little more than add yet another link to the chain of money-handlers.

Either revise the income tax “extra personal exemption” program to include all severely handicapped persons with relatively low incomes, not just legally blind persons who file a tax return, or restructure the entire program concept. The present extra personal exemption program for legally blind persons is clearly discriminatory; if the program is justifiable for them, by the same rationale it is justifiable for other severely handicapped persons. This program can be questioned on the grounds that it provides a “little something extra” for one type of handicap but not for other types with apparently similar needs, for tax-return filers but not for their children, for persons with sufficient income to pay income taxes but not for others with lesser incomes, and equally for both high-income persons and more needy lower-income persons. This program needs to be thoroughly studied and then revised.

One possible option would be to grant an extra one or two personal exemptions to each taxpayer and dependent who is severely handicapped. Another would be to permit deductions of a portion of all necessary extra expenses incurred because of the handicap of the taxpayer and any of his dependents, with the portion dependent upon the taxpayer’s income level and with a maximum ceiling on the amount of the deduction; this is implicitly a voluntary identification program, with the incentive being reduced taxes. A third option would be a revised type of income tax program for handicapped persons that provides benefits ranging from nothing for relatively high-income taxpayers to expense deduction for lower-income taxpayers, to an income “supplement” rather than an income “tax” for handicapped persons in the lower income range; clearly, an income supplement for the handicapped is one major and very flexible alternative to the present Supplementary Security Income program of income maintenance for handicapped persons. Annual qualification might be required and would be voluntary, but could be conditioned on a test of employability or on the person’s having participated in other programs such as vocational rehabilitation.

Government contact with youth in families receiving income maintenance represents an opportunity for identification of handicapping conditions, for transfer of youth from the AFDC program to the higher payment SSI program, for diagnosis and
treatment under Medicaid or some other health program, and for direction to programs that can supply other needed services. This opportunity should be fully exploited. As we indicated in Chapters 3 and 4 of this report and in Chapter 5 of R-1220-HEW, this opportunity is not being fully exploited, despite special provisions in the Medicaid program for identification and treatment of handicapped youth, and special provision for referral of disabled financial assistance recipients to the Vocational Rehabilitation Program.
Part III

EXPERIENCES AND RECOMMENDATIONS OF THE HANDICAPPED POPULATION
Chapter 11

SURVEY OF THE HANDICAPPED POPULATION

OVERVIEW FROM THE HANDICAPPED POPULATION'S VIEWPOINT

Evaluation of current and future service policies for handicapped youth requires information from both service providers and recipients. The sample of 77 families personally interviewed had received aid from 665 different service providers, and was selected about equally from (1) the three diverse states of California, Massachusetts, and Wyoming; (2) four types of handicapped youth: the totally blind, partially sighted, profoundly deaf, and hard of hearing; and (3) four age groups, 0 to 5, 6 to 12, 13 to 17, and 18 to 21. Although the sample is too small to use for other than heuristic purposes, the results provided useful insights into the needs and experiences of the handicapped, benefits of various services, and problems of the service system. The family survey should therefore be regarded as a supplement and cross-check on other analyses performed in this project.

When asked to determine the relative importance of various service needs, families overwhelmingly rated education highest. Medical services and sensory aids were also very important. Services considered and rated less important were vocational training, financial aid, transportation, job placement, counseling, and recreation. (We discussed the importance of identification and direction services, but did not ask the families to rate them.)

When asked if the 665 services had benefited their children, 62 percent of the respondents said they were very beneficial, 24 percent said they were somewhat beneficial, and 14 percent felt the services had yielded little or no benefit.

From the thoughtful and often well-informed opinions of the surveyed parents, a picture emerges of a service system that often surpasses the expectations of its users but has some important shortcomings.

Our interviews led us to make the following major observations:

- In general, service recipients appreciate the service system but are not fully satisfied with it;
- Initial identification of the handicapping condition is a major problem;
- Information about available services and direction to the appropriate mix of services is severely lacking;
- The range of services available within a reasonable distance of the families' homes is often very incomplete; and
- The quantity of service available is insufficient to meet the need.

Lack of Full Satisfaction with the Service System

Families were generally grateful for the available services, but they saw room for significant improvement.

When asked to assess their experiences with all services and rate their satisfaction with the service system as a whole, 40 percent of the families said they were very satisfied, about half said they were satisfied but not completely, and only 5 percent said they were definitely not satisfied. Parents of younger children and of less severely handicapped children were least likely to be satisfied. When asked
individually about each of the 665 services used, dissatisfaction was reported for 13 percent.

The Problem of Identification

The full set of needed services obviously cannot be given to a handicapped child until the handicap has been identified, and at present identification is too often haphazard, catch-as-catch-can. The parents in our sample reported that initial identification of the impairment was too frequently inaccurate (actual errors were reported by over 10 percent of the families interviewed) or was not made early enough to enable preparations for arranging as nearly normal development as possible for their children. Cases in point were profoundly deaf children who needed service during the preschool language development years. Several sets of parents of these children suspected a problem and consulted doctors. One child's pediatrician refused to believe the mother and would not test; four other children's doctors remarked variously that "nothing was seriously wrong," the child would "grow out of" the problem, it was "just a bad cold," or the child was "just fine." Another child was incorrectly labelled autistic, and another was treated by a psychologist for emotional disturbance for two years before his profound deafness was discovered.

The same problems occur with visual handicaps. One nearly blind child reached the first grade before her eyes were tested. Recounting the incident, the mother told us, "The kindergarten teacher just thought she was dumb." Still another partially sighted child was incorrectly called retarded.

Lack of Direction

The most frequently mentioned of all problems was the lack of direction — information about the mix of services needed and where to obtain them. Two-thirds of the families had difficulty finding appropriate services. Direction is presently a major problem because in most areas no one has all the information needed or the responsibility to coordinate help for families. The result is that there are gaps or delays in the services received, or inappropriate services are delivered.

Less than half the families were fully pleased with the appropriateness of the amount and variety of services received. Initially contacting the service system was typically either a matter of fortunate chance or time-consuming, frustrating search by the parent; once initial contact is made, the search for service is a chain-like process of going from one agency to another, one at a time, rather than a process of sitting down and choosing among an array of alternatives. The parents' feelings about direction were nicely summarized by one of them: "Someone should do it!"

Gaps in Available Services

Fully 60 percent of the families reported that needed services were not available within a reasonable distance. For example, local schools may offer services designed for blind youth but none for the more numerous partially sighted; several children had to go to residential schools so far away that their parents found it difficult even to visit them; eight families moved to obtain appropriate educational services; several families could not obtain speech therapy anywhere near their homes; mobility training was seldom available for young children; and vocational training options were said to be very limited.
Insufficient Supply of Service

Even when a service is provided, the supply may be limited. Some parents had trouble getting their children into nearby school programs because the classes were full. And in one state where high-quality counseling and direction is available, the agency is said to be so understaffed it is unable to see each family more than once or twice a year. In total, only 40 percent were fully pleased with the overall amount of services received.

Sensitivity of Service Personnel

Most families were pleased with the service personnel, but a small minority (approximately 10 percent) related experiences indicating insensitivity to the feelings or needs of the handicapped child and his family. Perhaps the worst case was the teacher who punished an 8-year-old girl for "disruptive behavior" by placing a paper bag over her head; being deaf, this represented loss of the child's major form of contact with the world, and she was terrified. Some parents complained that doctors would not take the time to explain anything or would treat their children as cases rather than as persons, or that the hearing-aid dealer was unable to work well with their young children. For example, one woman, suspecting deafness, had taken her child to a clinic for evaluation. After a long series of tests, they were sent home with instructions to call later in the afternoon for the results. Shortly before 5 p.m., the woman finally reached her doctor; sounding rushed and a bit annoyed at being interrupted, he told her, "Your child is fine, fine—oh, except that he's deaf." Later the mother realized that, after dealing with very severely and multiply handicapped children, the doctor might indeed have thought her son to be relatively lucky. But she, though not easily upset, was near hysteria when her husband came home. Another form of insensitivity is illustrated by the family whose child "wasted nine years" in a school that taught only oral communication for deaf youth, before they were told he was not progressing and should go to a school that used manual communication.

Parental Views of Government Roles

To find out what parents thought of various ways in which the government could help them meet their children's special service needs, we questioned parents about a few alternative possibilities.

Asked whether they preferred private to governmental service sources, about half the respondents said they did not care. As one said, "As long as help is there, I don't care where it comes from." Of those expressing a preference, equal proportions said "yes" and "no" (about 23 percent in each group). However, only 5 percent of the sample thought that any service role now being undertaken by any government agency was inappropriate. Most parents could not conceive of an "inappropriate" role.

A government role to provide information about available services was enthusiastically endorsed by over three-quarters of the families surveyed. Several also suggested, without being asked, that the government should supply more information to the public so as to "make it acceptable to have a handicap."

We asked if the parents would like to get financial vouchers with which they could obtain services from private sources of their choice, rather than directly from a government agency. We had a hard time explaining this possible government role to the families, and most were at best lukewarm toward the concept, remarking that they would not know where to spend the voucher or that unscrupulous service
providers would abuse the system and take advantage of them. In other words, they would still need a direction service.

We also asked their views about a national insurance program whose benefits would include payments for the added service needs of handicapped youth. About half the parents liked the idea; 25 percent did not; and the remainder thought maybe they would be interested. Several also noted that families without handicapped children probably would not like to pay for the insurance.

DESCRIPTION OF THE SURVEY

Survey Design

This survey involved personal interviews with a sample of 77 families of youth with impaired vision or hearing. The sample size was dictated by the need to have a reasonable number of youth in each subclassification (state, age, handicap) consistent with budget and time constraints on this research. We selected three states—California, Massachusetts, and Wyoming—from the five in which members of the project had extensively interviewed personnel in various state agencies, because the states had diverse types of service systems about which we were knowledgeable, because the states were different in size, population, region, and extent of urbanization, and because the contacts we had made provided a basis for requesting a wide variety of referrals.

Families were interviewed, rather than the handicapped children themselves, because we felt that youth, especially very young persons, might react unfavorably to being singled out as handicapped, impaired, or "different" in any fashion, or to the implied criticism of those providing service. In the case of youth over age 17, especially those living away from home, interviews were sometimes conducted with the handicapped person rather than the family, but these were the exceptions.

As one source of families, we contacted staff members of agencies with whom the project staff had dealt in the earlier phase of the study. Although this approach excludes respondents who are not being served by some agency, this is not a severe drawback. The survey is designed to tap attitudes and opinions concerning the system of services presently offered, and those currently in contact with the system are more likely to have accurate memory and detailed opinion about it. We also attempted to reach persons not served by the government programs by requesting referrals from private clinics and physicians, as well as from associations of the handicapped and from an assortment of types of agencies serving the handicapped. We also requested referrals from certain schools (both those serving the handicapped exclusively and regular schools with programs for the vision or hearing impaired), welfare agencies, and rehabilitation programs. This provided a wider range of responses and helped prevent the distorted patterns that would occur if agencies referred us only to their "star clients." We explicitly requested names of parents whose children were representative of the handicapped youth served, and requested three names for each interview to be conducted, thus making it more difficult for the agencies to select their "stars."

Other strategies designed to ensure a fairly wide range of responses to the survey include a threefold breakdown of the sample—by age, handicap, and geographic location. Four age groups are separated (0 to 5 years old, 6 to 12, 13 to 17, and 18 to 21). The divisions correspond roughly to life stages: preschool, elementary school, intermediate school, and young adulthood.
The sample is also broken down by handicap: blind and partially sighted for the visually handicapped; deaf and hard of hearing for the auditorily handicapped.

In seeking referrals, we tried to obtain equal numbers of families in each of the four age groups, four handicap categories, and the three states. When the interviews were completed, we found that 19 percent of the youth were under 6 years of age, 31 percent were 6 to 12, 25 percent were 13 to 17, and 25 percent were 18 to 21. Of the 77 families surveyed, 22 percent included a blind child, 26 percent a partially sighted one, 27 percent a deaf child, and 25 percent a hard of hearing child. We conducted 26 interviews in California, 25 in Massachusetts, and 26 in Wyoming.

We developed the questionnaire (see Appendix A) after examining, as models, several other instruments for assessing the service needs of handicapped persons and the effects of programs serving them. Using many open-ended questions, it attempts to elicit the past, present, and projected future needs of the respondents as well as their experiences with and evaluations of specific agencies’ services. One section of the interview asks how the client sees the service system as a whole—what unmet needs he perceives, what difficulties he has had in getting information or assistance. Attitudes toward alternative roles for government as a purveyor of services are also explored. The questionnaire attempts to get the “target population’s viewpoint” in a number of topical areas, for example:

- Needs for services;
- Deficiencies in single services or in the mix of services offered;
- Problems with the agency, mechanism, or personnel providing services;
- Goals and objectives of parents of handicapped youth;
- Importance of each type of service in relation to the others;
- Past, present, and projected future effect of various services on the quality of life of handicapped children;
- Effect of various services on physical skills, social skills, psychological states, financial states, etc.;
- Suggestions for services and program improvement.

A word of caution: the findings of the survey are based solely on the perceptions of service users, which may sometimes be inaccurate. Parents’ attitudes color and may distort their memories of services received. Some parents are grateful for any help that is offered, while others are perennially dissatisfied. In the latter case, for example, a parent may “forget” offers of services if they do not jibe with his own version of the child’s needs. Despite these problems, we feel that the views of clients are absolutely necessary in a comprehensive study of the service system, because they are the population the system should serve, and because the agency viewpoint itself is not free of distortions.

The Families

Both parents were present in 69 percent of the families, while only one parent was present in another 21 percent. Grandparents and guardians cared for the other 10 percent of the children.

Most of the children had brothers or sisters. Only 8 percent of them had none, while 18 percent had three or more siblings; in most cases, too, the handicapped child was the only impaired child in the family. The sample was about equally divided between males and females. In two-thirds of the cases, the child’s handicapping condition appeared to be stabilized. In 15 percent there appeared to be a possibility that it would become worse, and in 12 percent there appeared to be a chance that it would improve.
Most families were long-term residents of the state in which they were interviewed, four-fifths of them having lived there for at least 10 years.

The particular states chosen provide some variation along an urban-rural dimension. Overall, 25 percent of the surveyed families lived in a rural area and 72 percent were urban or suburban; the remaining 3 percent were persons interviewed in an institutional setting rather than at their homes.

We interviewed approximately equal numbers of families with vision-handicapped children in each state, but the distribution over age categories was uneven (only four such children were under five years of age). The same was true for the hearing impaired, who were mostly in the age groups 6 to 12 and 13 to 17. The replies to a series of questions designed to estimate the functional degree of hearing or vision impairment indicate that we interviewed approximately equal numbers of families with totally blind and partially sighted, and profoundly deaf and hard of hearing children.

Parents’ Objectives

Some definable types of parental goals for their handicapped children have emerged. The most ambitious is the wish to help the child “live up to his fullest potential.” In this view, expressed by 27 percent of the surveyed parents, the handicap is an obstacle to be overcome—not an insurmountable problem. One mother of a 19-year-old high school senior with very little residual vision remarked that he was able to “make up in intelligence what he lacked in vision.” The boy intended to become a scientist and was trying to choose between Berkeley, Caltech, and the Northrop Institute of Technology.

A second parental goal is to help the child “be as much like normal children as possible.” Normality is seen as the upper bound of the child’s possibilities. One mother of two deaf boys had made a particularly thorough attempt to compare her boys to normal children and to duplicate for them all the experiences of the others. She bought them hearing aids and Vibra-alarm clocks to increase their sensory independence; she encouraged them to have paper routes and other money-making projects; a physical education teacher herself, she enrolled them in an ice-hockey league and helped them engage in other sporting activities. She was eager to have them transferred from a special school for the hearing handicapped into regular schools, and liked the special school they attended because transfer was its goal, too. Thirty-eight percent of the families interviewed indicated that they hoped their children could become as close to normal as possible; this was the most frequently mentioned goal across all disability categories.

A third type of parent seems to have more limited goals for the child. Rather than normality, the parent hopes the child can achieve enough independence—financial and personal—to be a “functioning, if handicapped, member of society.” Such parents, 18 percent of our sample, seem to be particularly concerned with instrumentalities like special education and training that they see as a means to the end of independence.

Finally, the least ambitious goal is the wish to help the child “adjust to his handicap,” to come to terms with it in the sense of learning to live with it rather than overcome it. Only 8 percent of the parents we talked with seemed to take this view.

One factor that undoubtedly influences parental attitudes is the severity of the handicap. Most adjustment-oriented parents had blind children, while most “full-potential” parents and independence-oriented ones had partially sighted children. Another factor may be socioeconomic status. Upper-middle-class parents empha-
sized full potential, while most middle-class parents hoped their children could be normal. Lower-class parents also hoped for normality, but a sizeable minority were independence-oriented.

INFORMATION ON INDIVIDUAL SERVICES

The families’ experiences with and views on individual types of services are discussed next, followed by a digest of their comparisons across the various types of services. The data presented are derived from analysis of the 665 services used by the families interviewed. The types of services discussed are: identification; direction; counseling; medical services; sensory aids and other special equipment; education and special training; vocational training; job placement; transportation; personal care; recreation; and financial assistance.

Identification

The search for needed services for handicapped youth begins with identification of the handicapping impairment. Of the families with older handicapped youth, the age at time of diagnosis was 0 to 5 in two-thirds of the cases, and about 40 percent were diagnosed before the age of one. Of the four categories of handicaps we use, blind youth were identified the earliest: a majority before the age of one, and nearly 90 percent before entering school, probably because the condition is often more obvious than partial sightedness or loss of hearing ability. In contrast, less than one-fourth of the hard of hearing were identified by the age of one, and only about half by the age of five.

Usually the parent was first to notice the impairment. The most frequent sources of initial awareness of the handicap were: nonresponse to aural or visual stimuli (33 percent); unusual behavior, such as repeatedly falling down or inability to speak at a normal age (20 percent); visible impairment (17 percent); and a medical examination (14 percent). Vision impairment was most often readily apparent (35 percent) or physician-detected (22 percent), while hearing impairment was most often detected as a result of nonresponsiveness (45 percent) and only seldom by physicians (8 percent). As mentioned above, several parents of profoundly deaf children were much distressed by their pediatricians’ reluctance even to test for deafness, and other children were wrongly diagnosed. Inaction or erroneous action is very serious. Diminished hearing ability during the preschool years can inhibit the development of language and communication skills to such an extent that the child may be unable to overcome the resultant handicap even if services are given to him later.

Late or improper identification was also apparent in the interviews with families of partially sighted and hard of hearing youth. For example, one girl with a 60 decibel (dB) bilateral hearing loss was not identified until she was seven and went for a tonsillectomy, and a partially sighted child was incorrectly labelled retarded.

Pediatricians knowledgeable about hearing problems are especially important because parents turn to them most frequently for advice when an impairment is suspected. General practitioners also serve as initial advisors as do medical specialists in vision or hearing problems. According to our survey, medical professionals were chosen as initial advisors by almost 60 percent of the families; relatives and friends were chosen by about 30 percent.

To sum up our observations: (1) Identification is haphazard—too often a matter of chance, not an organized routine that would give all handicapped youth an early
start on the road to needed services. (2) Very significant numbers of the handicapped, particularly the deaf, are either not identified at an early age or are misidentified as having some other impairment. (3) Physicians, to whom families most often turn when they suspect their child has a problem, are not as well trained or as sensitive to potential handicaps as they might be.

Counseling

Parents expressed their need for four kinds of information and counseling. First, they want to know about the handicap itself: what it is, what causes it, and how it will affect the child's development. Second, they need counseling concerning their children's needs and abilities and what they can do to help; even parents who have already reared several children feel they have to "start all over" with the impaired one, and they need advice on how to go about it. Third, parents and their handicapped children may both require psychological counseling. And finally, parents need information about available services. Direction, the fourth information need, will be discussed later in this report.

One-fourth of the families surveyed had used counseling services for their children, and about one-half had received parent counseling. These figures are probably higher than the national average, since in both Massachusetts and Wyoming, agencies providing counseling services actively seek out the visually handicapped; however, comparable service is not provided to the hearing impaired.

Only one parent thought that counseling was a major unmet need for the child; eight others would have used counseling had they known where to ask for it. Only two interviewees thought parental counseling had been a major unmet need; fourteen others would have used it had it been available. About one-third of the families thought they could benefit from counseling in the future.

About half of those counseled thought that the service was very beneficial—a high rate, indicating the strong need for advice (especially at the beginning of the child's life). Only 3 percent felt it had no effect.

The families used 78 separate counseling services, about evenly distributed among the states and handicaps. Of these, 18 were offered by private organizations (a notable example is the John Tracy Clinic and its correspondence course for families with hearing handicapped youth), 41 were state services, 4 were from private professionals and 9 were from associations of the handicapped or their parents. Referrals to counselors came from doctors in about one-third of the cases surveyed; about one-fifth were recommendations from schools; about one-tenth came from welfare agencies; and about one-tenth resulted from the parents' own research or the recommendations of other individuals.

Although most of the families that used counseling services found them satisfactory, 10 percent (a rather high rate compared with most other services) were not satisfied. A major criticism was that counseling services were not appropriate to the problems of the child or family. For example, a local PTA had obtained and paid for a psychologist's services for a high-school-age deaf girl. Rightly or wrongly, she was mildly annoyed by his "psychologizing," preferring that he offer her more practical guidance in the choice of a vocational objective. Since a counselor must often deal with the very personal problems of his clients, it is not surprising that he sometimes is perceived as intruding on the privacy of the client. Several persons expressed resentment at "personal questions," and one young divorced mother of a partially sighted and hyperactive boy refused to go back to her counselor because "He told me I was a bad mother." (The families' criticisms, while they deserve to be noted, tabulated, and respected, should sometimes be taken with a grain of salt. Every
counselor is familiar with client resistance, the anger that unpleasant truths can arouse, and the frequent distortion of the counselor’s remarks. This is not to deny, of course, that some counselors are inept and that even the good ones can make serious mistakes.) On the other hand, many counselors received rave notices from families that had benefited from their support and advice. A third problem is that the counseling agencies are so understaffed that most families that are served are contacted only once or twice a year.

Medical Services

All but one of the families surveyed used at least one medical server, and 60 percent used two or more. This high usage rate is reasonable since each hearing or vision handicapped youth needs at least to be examined by a physician, probably a specialist, to ascertain if anything can be done to correct or alleviate the impairment, or to prevent further deterioration of sensory ability. In many cases, however, the parents were simply double-checking because they were reluctant to accept one man’s diagnosis of a severe and uncorrectable hearing or vision impairment.

Upper-income families used more medical service than did other groups, but lower-income parents used more than middle-class ones did, perhaps because they had better access to public financial aid to pay for treatment.

Of the 131 different medical servers used by families in our sample, 86 percent were “private professionals,” while 7 percent were obtained through state agencies (such as the Crippled Children’s Service) and 2 percent through charitable sources. About half the doctors were located less than ten miles from the respondents’ homes, but more families are willing to travel long distances for this service than for any other: a dozen traveled over 100 miles each way for the service. Medical care is sought more intensively than other services. Although most parents seldom considered more than one source for any other service, fully 25 percent of them considered more than one doctor before making an initial choice. If refused service, respondents almost always continued their search elsewhere.

Eleven families wanted additional medical services, but many of them admitted they were hoping for “a miracle,” rather than needing a specific service. However, lower-income families expressed unmet medical needs more often than other income groups and generally cited expense as the reason.

Satisfaction with medical services was lower than for any other service area. Families indicated that 12 percent of the doctors were “not competent” and 11 percent were “not courteous.” The commonest complaint was that medical personnel were “impersonal.” In several instances university-affiliated hospitals were cited for treating children as cases rather than persons. As discussed above under “Identification,” parents complained that pediatricians sometimes disregarded their insistence that something was wrong with their children, especially in the cases of the hearing-impaired. Several other parents complained that physicians diagnosed the problem correctly but were unable to advise the families what to expect of the child or where to go for services to meet his special needs. Of course, comprehensive, nonmedical guidance is neither the doctor’s nor anyone else’s responsibility in most states. However, when a doctor or another member of a hospital or clinic staff was well informed and offered nonmedical guidance, a much-needed service was performed which the parents later remembered with gratitude. Another problem cited with medical treatment services included transportation to a distant service location (mentioned in one-fourth of the cases of service use).

Financial problems plagued some families, though most regarded the burden as
a "necessary evil." More than half the respondents paid at least part of the cost of the medical care they received (most other services were provided at little or no cost). Forty-two percent of the families received financial assistance from a source other than their own resources or personal insurance to help pay medical expenses. For two-thirds of those who received no such aid, however, medical care was cited as a financial hardship.

Another problem cited was doctors' failure to appreciate the possibility of multiple impairments, a potential difficulty with highly specialized physicians. One mother whose daughter is a national hula-hoop champion despite being aphasic and visually and auditorially handicapped, did not learn about the aphasia until a school psychologist amassed all the medical reports concerning the girl and tried to take an overview of the girl's problems. He was the first to suggest aphasia. Later, the same child was also found to have an allergy that affected her hearing. Shots to combat the allergy have made a significant improvement in her hearing.

All in all, the major problem with medical services does not appear to be in the quantity or quality of the treatment given after diagnosis, but in the diagnosis itself.

Despite these deficiencies, the families regarded 35 percent of the medical services as very beneficial, and about 36 percent as beneficial to a lesser degree. Only 18 percent of the medical services were said to have had no effect on the child, and only 6 percent were thought to have had detrimental effects.

Suggestions for improving medical services included the following: Some medical agency or some one doctor in a group practice should take the responsibility for collecting and evaluating all of each child's medical records. Doctors—especially pediatricians, who are usually the initial advisors of parents with handicapped children—should be sensitized to the possibility of handicapping conditions and to the need for early diagnosis of handicaps such as deafness, and should possess information concerning available services. Doctors should be encouraged, even required, to report impaired children's names to state agencies or associations of the handicapped so that service personnel can get in touch with families. Doctors should be given special training in testing children for handicapping conditions. Finally, several parents stressed their wish that the government would sponsor further research into handicapping conditions. They feared they were "hoping for miracles," but with characteristically American faith in technology, they thought concerted efforts could produce better results, if not cures.

**Sensory Aids and Other Special Equipment**

All but five families had used at least one sensory aid or equipment service; these included hearing aids and lenses as well as aids for mobility (canes and guide dogs), for reading (braille and talking books), and other equipment (special watches, alarm clocks, tape recorders, slates, toys, etc.). Service use was directly related to income, which accounts for the fact that 30 percent of the low-income families claimed they needed additional equipment, while only 12 percent of the upper-middle-class group expressed similar needs. The expense of equipment was cited by ten parents who thought their needs were not fully met. For essential equipment, such as a hearing aid, parents typically settled for less than the best. Another eight families said that the service or equipment they needed did not exist (they mentioned such things as special amplifiers for TV sets and books for blind toddlers).

Of the sensory aids or special equipment services discussed, 43 percent were hearing aids, 25 percent were reading aids (e.g., braille books and tapes), and 16 percent were lenses or magnification aids. In one-third of the cases families were
referred to the service by their doctor or audiologist. School personnel recommended sensory aids or special equipment in 13 percent of the cases, and state agencies for the visually handicapped accounted for 11 percent of the referrals.

Although commercial dealers were frequently used, parents did little comparison-shopping for either cost or quality. Two-thirds of the time they considered no alternatives, usually selecting a dealer or agency because someone had recommended it, but the next-most-frequent reason was that it was cheaper. In two-thirds of the cases, all or part of the cost of the aid was paid by someone other than the parents themselves.

One-third of the service purveyors were rated very satisfactory, another half were said to be satisfactory, and only one in ten caused dissatisfaction. The aids themselves were rated very beneficial by about two-thirds of the families with partially sighted or deaf children, and by about half the families with blind or hard of hearing children. The most dramatic and glowing praise was given to the change resulting from a hearing aid: one child began to talk for the first time soon after receiving the aid, and another, a 12-year-old, markedly improved his grades after he received his first hearing aid. Only one in ten service users said the sensory aid or other equipment had no beneficial effect.

Several problems were noted by the families using sensory aids or other special equipment services. Fourteen percent said they had to wait much too long for service—usually while the bureaucracy processed the request or while hearing aids or braille books were mailed from out-of-town sources. A Wyoming junior-high-schooler did not receive materials for one course until a week before the final test.

A second problem was noted by parents buying hearing aids and corrective lenses. They usually were given insufficient advice about motivating the child to use the aid and for using and maintaining it. Hence, several cases were found of children not benefiting because the aid was in poor repair or because the child refused to wear it. Another problem was selecting an aid and a dealer. Sometimes audiologists would recommend a special brand, but only one dealer specializing in that brand served the area where the family lived. A few respondents felt "at the mercy" of the audiologist's expertise. When a specific type of aid was not recommended, however, several parents said they were at a loss to choose. One family applauded their audiologist for recommending a type of aid and discussing with them the dealers in their area who sold various brands. He would not recommend a specific dealer, but he told them which aids were most expensive and which dealers had been criticized by other parents. One parent also noted price-quotations ranging from $200 to $385 for precisely the same make and model of hearing aid.

Finally, dealers were occasionally criticized for what parents felt was poor service or improper conduct. Some did not inform parents that state services were available to pay part or all of the cost of the lenses or other aid; others seemed too "commercial," e.g., trying to push the more expensive models of hearing aids. Hearing aid dealers were also criticized for their inability to work well with young children. Aside from the parents' opinions, several cases of poor initial selection of an aid or incorrect fitting of an ear mold attest to the presence of a problem.

Suggestions for improvement included special training or licensing of dealers and the provision of information to parents on the merits and costs of different aids. Parents also advocated wider availability of information on use of the aids and programs to pay for them. Finally, parents hoped for the development of new kinds of equipment, such as individualized amplifiers for the television so that a deaf child could have a higher volume of sound while the rest of the family preserved the integrity of their eardrums, and a quieter braillewriter so blind students could take
notes without disturbing classmates; and for a wider variety of existing equipment, such as more braille and talking books for each age and type of child.

The major message about sensory aids, however, was that they can be extremely beneficial. Consequently, while a few hundred dollars for a pair of glasses or a hearing aid may seem like a great deal, parents believe the cost is reasonable enough in view of the effects they can have on a child’s life.

**Education and Special Training**

Educational and special training services had been used by 69 of 77 families we surveyed. Services included both preschool and regular academic education and the special training needed by impaired children. For the hearing impaired, this usually meant speech therapy, and for the visually impaired, mobility training. As with medical treatment, both upper-middle-class and lower-income families used more services than did middle-class parents. All children who had not been served in any educational program were less than five years old.

Although these handicapped youth went to school, many received no special education services. The breakdown by type of educational program was: nursery or preschool, 9 percent; regular class only, in public school, 26 percent; regular class with special equipment, in public school, 4 percent; regular class supplemented by special program for the handicapped, 21 percent; special class for the handicapped only, in public school, 12 percent; residential school, 8 percent; and private school, 7 percent. Deaf youth were most often served in special classes for the handicapped only, or in a regular class only; while hard of hearing youth were most often served in a regular class supplemented by a special program or in a special class for the handicapped only. Blind youth were most often served in a regular class only, or in a residential school; while partially sighted youth were most often served in a regular class only or in a regular class supplemented by a special program.

About one-third of the referrals to educational services came from within the educational system. Another fifth came from doctors and about 30 percent were from counselors, such as those affiliated with state agencies for the visually handicapped, who helped the parents of the more severely handicapped find the right special schools for their children and who were also instrumental, for example, in helping older children find the right vocational training for a post-high-school education.

Most educational services were provided out of public funds, but some—especially preschool or special training—were funded from other sources. Parents themselves paid for 13 percent of the services received, and 7 percent were paid by charitable organizations.

In general, educational services were deemed important and highly satisfactory. Service was typically felt to be sufficient, individualized, offered by competent and courteous personnel, and very beneficial to the youth. The parents of more severely handicapped children tended to give "very beneficial" ratings more often than those of less-impaired youth (80 percent versus 60 percent). Only three families felt the schools were "slightly beneficial," and none said the schools had "no effect."

Several problems were mentioned. One common cause of dissatisfaction was the lack of school programs in the immediate geographic area and the need to send the child to a faraway residential school for most of the year. One result was that parents found it difficult even to visit the child. Another result was that eight families, six of whom had deaf children, had moved expressly to be near a good school for their children.

Another problem related to distance occurred when children had to be trans-
ported daily to special schools; only 61 percent of the students went to school within ten miles of home. Though they lived at home, they could not participate in after-
school activities because transportation consumed so much of their free time. One in five students attended a school (including residential schools) more than 50 miles from home.

Parents' views on the curriculum were also noted. One-third of the parents, especially those of blind children and parents of children in residential schools, felt that schools should place more emphasis on the "3 Rs." One-fifth of the parents, usually of the more severely impaired children, thought there should be more attention given to training for activities of daily living. Parents with children in special classes typically thought they were getting enough development of social skills, but only half the parents whose children were in regular classes or residential schools agreed. One blind young man argued that residential schools should do more to encourage a spirit of independence in their students.

Occasionally, educators showed insensitivity to the needs and feelings of impaired children. One girl was, in the opinion of her mother, subjected to subtle ridicule by a teacher who continually pointed out her handicap during classes. We have mentioned the 8-year-old girl who was punished for "disruptive behavior" by having a paper bag placed over her head. Other teachers were said to be too willing to keep the child dependent, or to interpret as misbehavior what was really the result of an impairment—for example, the inattention of a deaf child.

Finally, parents sometimes felt that no available program was exactly right for their children's needs. Some parents of deaf children, for example, found that schools emphasized either the oral or the manual method of teaching to the exclusion of the other. They had to send their children to distant or expensive private schools to get the training the parents felt they needed. Several parents with partially sighted or hard of hearing youth mentioned that the only available programs were designed primarily for blind or deaf youth. In two cases, hard of hearing youth were forced to use sign language instead of talk because they were in a school for the deaf. Two other partially sighted youth were taught to read braille instead of printed type because they were in a class for the blind.

Most parents were satisfied with the amount of education received. Six families were not, all of them families with visually handicapped children; 13 others said they would have used more service had it been available. Because of crowding, 11 families had been refused service at the school of first choice. In Wyoming, some parents said their needs were unmet because the services were unavailable in the geographic area; and in Massachusetts, some parents complained because there was no high school for the deaf in their area. One parent suggested that, at the very least, every state and every major metropolitan area should offer a complete range of educational services for handicapped youth.

Two particular kinds of special training were explicitly considered in the survey: speech training for audiorially handicapped youth and mobility training for the visually impaired. Thirty-four of the 40 families with hearing handicapped youth had used speech therapy services. Nine families were dissatisfied with speech therapy as a service, usually because it was *not available in the interviewee's area*. With adequate hearing aids and speech training, many hard of hearing youth can be educated in the regular classroom, instead of needing more expensive, specialized education programs. Thirteen parents had sought and used mobility training services; most of the recipients were blind, not partially sighted, and most were older children. Unmet needs were felt by four parents of totally blind youth. They were unable to obtain service either because it was not locally available or because the children were too young to be eligible. Some parents noted, however, that the
services really should be offered earlier than they typically are; as one blind girl in
California explained, by the time she was given mobility training in high school, her
fears and inhibitions had become so ingrained that she was unable to profit fully by
it.

Providing relevant information to the parent was another suggested improve-
ment: information on what training programs are available and how to choose
among them, and information on how the parent can help in the child's training at
home.

Vocational Training

Four of our respondents had received vocational training: two from a public
rehabilitation agency and two from private, commercial training schools. Two of
them had used vocational training services only, and two others had been placed in
jobs by the schools they attended. Vocational training was not regarded as one of
the more important service needs. Most families would not even travel to obtain the
service.

Unmet needs were expressed by 12 families, who said that services did not exist
as far as they knew, or were not available in the area. Thirteen others thought they
might need vocational training in the future. Of these, eight planned to seek help
from state or local public agencies; however, most said they thought the service
would make some difference but not a great one in their children's lives.

Overall ratings of those receiving vocational training included one family that
was very satisfied, two who thought the service was satisfactory, and one young blind
woman who was not satisfied. She felt that the service was not helpful because little
imagination was shown in choosing jobs for which to train blind youth. She had
learned to be a darkroom technician but did not like the work, even when she could
find it. Of families that had investigated but not requested service, it was thought
that the vocational rehabilitation agency's occupational training choices were limit-
ed in both number and desirability. One said he had heard the agency would reject
deaf persons with poor speech; another said friends had told him "not to use VR"
because of the low occupational expectations the counselors have for deaf people.

Job Placement

Only five of the older youth whose families we interviewed had held a regular
part-time or full-time job for more than a year. About three-quarters of the 28 youth
who had worked at all had had problems; and the majority of those felt their
handicap was the major reason.

Despite these problems, only eleven sets of parents in our sample had any
contact with placement services. In four of these cases, the service was limited to
the provision of information about available jobs, although in one other case the
counselor applied in the youth's name. Three of the youth served were offered only
counseling or vocational guidance, not actual job placement services. Placement
services were not regarded as critically important by any of the families; only one
parent would pay for the service if necessary, and only one would travel to obtain
it. Three parents who had been unable to find placement assistance felt that it was
a "great need," however, and six others would have used the service had it been
available. Most who were unhappy with placement services explained that they did
not know where to go or said the service did not exist in their area. Of those using
placement services, five rated them "very beneficial," while two each thought they
were of "some," "slight," or "no effect."
The only suggested improvement was that rehabilitation personnel should act as advocates for the youth or should try to persuade businesses to consider the applications of impaired youth, and then inform the young people of those who were willing.

Personal Care

Only ten families in our sample had used personal care services: four had hired a day nurse at some time or another, and the rest used full-time but temporary babysitters or relatives. Only 5 families said they had ever wished for help in caring for their children but were unable to find it. A few parents thought they might possibly require personal care services in the future, but only one of them thought getting the service would make a "great difference." In brief, the families felt that they were capable of meeting the personal care needs of their visually or aurally handicapped youth.

Recreation

One-third of the families surveyed had used recreation services of some sort, usually parties, summer camps, and field trips. Almost two-thirds of the blind children had used at least one recreational service, but only 40 percent of the partially sighted, 24 percent of the deaf, and 10 percent of the hard of hearing had done so. This was partly the result of service availability; although 68 percent of the blind children had been offered recreational services, only 45 percent of the partially sighted, 38 percent of the deaf, and 26 percent of the hard of hearing had received offers.

A significant minority of the parents felt that their children needed more opportunities to interact with peers. Recreational service users were mostly from this group; perhaps these services are sought to fill in perceived gaps left by schools and neighborhood activities. About half the families said they would use more recreational services if they were available. Two-thirds of the rural residents cited unmet recreational needs, mostly because the services were not offered in their area. Urban and suburban respondents thought the services were probably available, but they did not know where to ask about them.

Of the 26 recreation services used, about half were provided by charitable organizations, with associations of the handicapped the next largest source. Most of the families did not regard recreation as a critical need, but those who used services were well satisfied with them. They praised two results of the services: their children learned to be more independent, and they met new friends.

Two problems with recreational services were noted. For children who attend residential schools or special programs in public schools, organized recreation cuts into their time with their families. Parents whose children are away in school all year are loath to part with them in the summer. Second, participation in recreational programs tends to decrease opportunities for play with normal children in the neighborhood. (On the other hand, for children in public schools, recreational programs for handicapped youth provided needed opportunities to interact with other children like themselves.) Some parents felt that programs should be devised to provide a mixture of handicapped and normal children.

Transportation

Thirty-five of the families surveyed had used some sort of transportation service, mostly school bussing. Only one-third of rural residents were getting transportation
service, compared with about half of those living in urban or suburban areas. Of the 48 separate transportation services used, one-third were offered by state agencies and one-third by local school districts. Charitable organizations, such as the Foundation for the Junior Blind in California, supplied 16 percent. As with information about many other services, knowledge of programs supplying transportation was more often a matter of luck than routine dissemination of the information. One Massachusetts mother walked a mile with her five-year-old blind daughter to school each day because she did not have a car and no bus service was available. Pregnant and near the end of her term, she began to worry that she would have to send the little girl to school alone. Finally, she asked a teacher at the school what to do, and the teacher offhandedly replied that she should "use the taxis." The mother knew she could not afford that, so she worried for a few more days. At last she mentioned her problem to another mother, who informed her that the state provided free taxi service to school for handicapped children. She thought the school should make a systematic effort to inform parents of handicapped children about the range of services available to them.

Quite a few families were willing to fight for transportation service if refused it. Not long before the interviews were conducted, a new director of educational services for the handicapped was appointed in Massachusetts. One of his first acts in office was to cut back transportation services, whereupon an army of enraged parents camped on the Capitol steps. As a result the level of service to many was reinstated.

One-third of the sample said they had experienced unmet needs for transportation. About 60 percent of the rural families had had transportation problems; urban and suburban families also cited problems in about a third of the cases. Transportation difficulties resulted in a general reduction in the use of other services for 10 percent of the families surveyed.

Although most families managed to find transportation to other needed services, many of them faced problems in doing so. Since the handicapped population is widely distributed geographically, many of them must travel long distances for services, and this imposes numerous costs. Often the parent must pay for the service itself; he must also pay his own transportation and living costs if, say, medical care is offered in a distant city; and he sacrifices time that could be spent with other children or even at work. Several fathers had to arrange days off to drive their children to hospitals.

Transportation to the point at which other services are provided has been a problem cited many times before in our discussion; the reason it is such a problem is that the handicapped population is dispersed widely, while service agencies often are not. That is, transportation is not a problem primarily because the youth are handicapped, but because the service agencies are located as they are.

**Financial Assistance**

Fifty-six percent of the families surveyed had received financial aid either directly or to purchase other specific services.

A total of 51 financial services were used, of which 10 percent were private charities and the rest were public assistance of some sort, split about equally between hearing and vision impaired youth. The volume of funds expended is not known. In 6 percent of the cases, the aid was an income supplement, 8 percent of the time it represented full or partial payment of school tuition, 28 percent of the cases were for medical bills, 14 percent paid for special equipment, and 28 percent of the cases were for more than one of these purposes. In addition to funds, some
counseling was provided in about one-third of the cases. These figures do not include cases of the direct provision of service such as schooling, when no financial reimbursement is involved.

Almost one-third of the respondents said they would have liked more financial assistance, and in 9 percent of the cases it was expressed as a major need. One-third of those who expressed needs said they did not know where to ask for help, and another third had been refused financial aid.

About half the sample thought their children might need financial assistance in the future—10 percent were fairly certain they would.

A few problems with financial aid services were cited. A few people had experienced difficulty or delay in arranging payment of medical or special equipment services through state agencies. A few wished that a wider range of services could be provided—such as transportation to a medical or educational service facility, or additional equipment. But most users of financial assistance were delighted to have it, and three-quarters of them thought it sufficient for their needs. Two families charged discrimination in that the blind get an extra income tax deduction while the deaf do not. One family did not take full advantage of needed speech therapy service because they couldn’t afford it and did not know the state would assist them. Several families expressed displeasure at having to accept funds labelled as "welfare," and were displeased with the quality of welfare agency personnel.

One suggestion for improving the financial aid service was to develop a special definition of indigency for parents with handicapped children, much as the Medicaid program has a "medically indigent" classification that includes more persons that the "indigent" classification does.

DIFFICULTIES WITH INFORMATION ON THE SERVICE SYSTEM

Once a handicapped child has been identified, he or his family needs to know what mix of other services is needed and where to obtain them. The determination of the appropriate mix of services and service providers is what we call direction. Only one-third of the families said they had experienced no difficulties in finding appropriate services; another third reported some problems, and another third had had many problems. Parents of hard of hearing and partially sighted children were far more likely to have experienced "many problems" than were parents of blind or deaf children. Gaps in the services available were reported by 60 percent of the families. Only 40 percent were fully pleased with the sufficiency or overall amount of services received, and families with preschool handicapped children or less severely handicapped children felt the least satisfied. Slightly less than half the families interviewed were fully pleased with the appropriateness of the package of services delivered to them; that is, they felt they were "offered the right kinds of services." The families with less severely handicapped youth, or preschool handicapped youth, or hearing handicapped youth were least likely to be fully pleased with the appropriateness of services. Thus, more than half the families reported problems with direction to various services: most reported gaps in the services provided, lack of full satisfaction with the sufficiency of the services provided, and lack of full satisfaction with the appropriateness of the mix of services. Direction is clearly a major problem. Parents generally reported lack of information about what services are available, and where to obtain them. As one parent put it, "There are so many government agencies, the people don’t know where to go." Another frustrated parent made
an excellent point: "I don't even know what questions to ask." Many reported a "chain of talking and talking and talking" and of referrals "from place to place to place" until, with persistence and much "stumbling around," they found someone who could tell them where to get the needed services. Others were simply lucky, as when a speech therapist accidentally met a deaf child in need of help in a furniture store. In general, however, no one had either the information or the responsibility to help the parents plan an appropriate mix of services and direct them to the service providers. Two notable exceptions are the Division of Services to the Visually Handicapped in Wyoming and the Commission for the Blind in Massachusetts. A good direction program could also eliminate much unnecessary retesting of children by various service providers who presently do not have easy access to each other's test results.

Parental persistence and tediously acquired knowledge of available services clearly made a difference in what the child received. For example, the most services we observed being received by a single family went to a deaf child who lived in a foster home with 11 other children (8 of them multihandicapped) and with two very experienced, savvy, and persistent foster parents.

SUMMARY: PARENTAL SATISFACTION WITH THE SYSTEM AND INDIVIDUAL SERVICES

Overall Satisfaction with and Benefits of the Service System

Finally, parents were asked to give their views on their general satisfaction with the service system, and their general assessment of how much their child had benefited from the package of services received.

Forty percent of the families said they were very satisfied with the overall system; about half said they were satisfied, but not completely; and 5 percent said they were definitely not satisfied. Parents of younger children and of less severely handicapped children were least likely to be satisfied.

In assessing the degree to which the service system benefits handicapped youth, 62 percent of the respondents thought the services had been very beneficial on the whole, 24 percent thought they were somewhat beneficial, and 14 percent were convinced the service system had had little or no benefits. Within the majority of parents who felt the overall service effects were very beneficial, however, there were significant variations by type of handicap (67 percent for the hearing impaired versus 57 percent for the vision impaired), and by age (70 percent for 18- to 21-year-olds versus 54 percent for children 0 to 5 years old.

Relative Importance of Individual Services

As we have seen, the parents rated both individual services and the system as a whole as to their overall satisfaction, the competence and courtesy of the personnel, and each service's benefit to the youth. A summary look across the services is presented here.

Parents were fully satisfied with 38 percent of the individual services delivered, partially satisfied with 49 percent, and dissatisfied with 13 percent. The three services they considered most important were education, sensory aids, and medical treatment. Of these, educational services received the most "very satisfied" ratings, and medical services the fewest. Similar findings characterized personnel ratings:
though very few service agencies of any sort were said to have discourteous or incompetent staff, medical servers and special equipment dealers received more uncomplimentary ratings than did other servers, while medical servers and educators received more "very good" ratings than did other servers. Educational services were given the most "very beneficial to the youth" ratings, with sensory aids and medical treatment following.

Several questions were asked to determine the relative importance of various services to parents. One question was what they thought to be their preeminent service need at the time of the survey. Education was the overwhelming first choice across all categories of parents, followed by special equipment and medical service. We emphasize that these rankings are of current need, not of needs throughout the child's lifetime. The remaining services were, in decreasing order of rated importance, vocational education, financial aid, transportation, job placement, counseling, and recreation. We did not ask the interviewees to rate the identification or direction services.

As another measure of importance, we asked parents if they had undergone financial hardship to obtain any services. Two-thirds of those who said yes had done so for medical treatment, about one-fifth for sensory aids, and one-tenth for education. When asked what services they would pay more for if necessary, the three mentioned the most often were education, medical service, and sensory aids. Parents were also asked whether they would be willing to relocate to obtain any particular service. Nearly all of those who would move would do so for medical treatment or education; three families did move to obtain better medical service, and eight moved to obtain educational services. Of all the services, parents were most willing to travel to obtain medical treatment or sensory aids, and to obtain education (although they strongly preferred to have their children attend schools near home). They said they would not, and did not, travel far to obtain the other services.

Finally, we asked what strategies parents would use if refused a specific service. Summing the responses for all types of services, 85 percent would "continue the search," 9 percent would "fight," and 7 percent would "forget it." Most of those who would "fight" would do so for educational services; those who would "continue the search" would seek medical treatment, sensory aids, or education; and those who would "forget it" were speaking of transportation and recreation services.
Appendix A

INTERVIEW GUIDE FOR HANDICAPPED YOUTH SURVEY

This appendix contains the interview guide used in our person-to-person survey of families with hearing or vision handicapped youth. Schedules A through D were not followed precisely during any interview, but rather served as a topic guide; where desirable, topics were added or deleted. The written schedules were never given to the interviewee, and the questions evolved and were adapted from the initial version printed in this appendix to reflect the interviewer's experience and the respondent's particular situation. Cards A and B were given to respondents to help them express and quantify their subjective opinions on the value of various programs and services.
The Rand Corporation is a nonprofit organization that does research on various subjects. In this project we are trying to help the Department of Health, Education and Welfare evaluate its programs for children whose hearing or vision is impaired. We want to know how well those programs are working, so that the government can improve them or devise new ones; and therefore we need to know the opinions and experiences of people who have used those services. The people on this project do not work for the Department of Health, Education and Welfare or any other government agency, however. We work for a private research organization.

Because we want to know about your experiences and opinions in some detail, it may take quite some time to answer all the questions. I hope you won't mind, because the information you can give us is very important.

I want to assure you, too, that The Rand Corporation will not be putting your name in any published report, so we hope you'll feel free to be perfectly candid.

I'd like to begin by asking some questions about the sorts of things you might have felt a need for as a result of your child's special problem. I'm interested in finding out about what you have needed in the past and what you need now (even if you're not able to get it)—and also what sorts of things you expect you might need as your child gets older.

Incidentally, when I talk about "services" or "service agencies," I have in mind any place you go to get the things you need—government agencies, associations of the handicapped, private doctors or clinics, regular or special schools, anything.

a. First, what is the child's name?

b. How old is he (she)?

c. How many other children are in your family?

d. What are their ages?

e. Do any of them have impaired hearing or vision?
I-1 MEDICAL TREATMENT

1. Has your child had medical treatment specifically for his vision or hearing problem?

   (INTERVIEWER PROBE)
   ___testing and evaluation (how often?)
   ___past treatment
   ___current treatment (how often is it needed?)
   ___type of medical or surgical treatment

2. (IF YES) Where do or did you go to get this treatment? (FILL OUT SCHEDULE A OR B.)

3. Has there ever been medical treatment that you thought you might have needed but for some reason could not or did not get?

4. DIAGNOSIS AND SCREENING

   a. What sort of vision/hearing impairment does your child have?
      Do you know the medical name of the problem?
   b. When did you first find out that he had vision/hearing problems?
   c. How did you find out?
   d. Did you ask for or did anyone give you advice about what to do?
   e. What did you decide to do? Why?
   f. What is the probable future course of the impairment? Will it become better, worse, or stay the same?

5. Will your child need medical treatment for his impairment in the future? (IF YES, FILL OUT SCHEDULE C.)
I-2 SPECIAL EQUIPMENT

1. Has your child ever used special equipment to aid his hearing or vision?
   ___ eyeglasses
   ___ telescopic or microscopic lens systems
   ___ hand or desk-mounted magnifiers
   ___ closed circuit TV systems
   ___ large print books
   ___ tapes
   ___ canes
   ___ guide dogs
   ___ hearing aids (body)
   ___ hearing aids (ear)
   ___ special alarm clocks
   ___ telephone amplifiers
   ___ other (SPECIFY)

2. (IF YES) Where did you go to get this special equipment? (FILL OUT SCHEDULE A OR B.)

3. Was there ever any special equipment that you thought you might have needed but for some reason could not or did not get?

4. Is there any special equipment that you think your child might need at some time in the future? (IF YES, FILL OUT SCHEDULE C.)

I-3 PERSONAL CARE

1. Have you ever had to hire someone to take care of your child's day-to-day needs relative to personal care?

2. (IF YES) Where did you go to get this service? (FILL OUT SCHEDULE A OR B.)

3. Have you ever felt that you needed someone to help you care for your child's personal needs but for some reason could not or did not get this help?

4. Do you think your child will, at some future time, need someone to help him take care of his personal needs? (IF YES, FILL OUT SCHEDULE C.)
1. Let's talk for a moment about your child's education. Does he go to school? (IF YES, FILL OUT SCHEDULE A OR B.)

   (INTERVIEWER PROBE)
   _____ residential school (public or private?)
   _____ self-contained classes
   _____ tutoring
   _____ special classes in addition to regular school program
   _____ regular school (public or private?)
   _____ regular school with special equipment (what equipment?)

2. What grade is he in?

3. Do you know whether there is a program at his school to test the vision and hearing of the children? At what age are they tested?

4. (FOR DEAF/HARD OF HEARING ONLY) Is your child receiving speech therapy?

5. Have you ever felt that your child could have used some special education or training that for some reason you could not or did not get?

6. Would you like to see more emphasis, less emphasis, or the same emphasis in school on any of these areas:

   More Less Same
   a. Reading and writing
   b. Speech
   c. Mobility (getting around at home, in the city)
   d. Vocational training, job training
   e. Activities of daily living
   f. Social skills, getting along with others

7. What sort of future educational needs will your child have?

   (INTERVIEWER PROBE)
   _____ college? where?
   _____ learning to cope with his handicap? (IF YES, FILL OUT SCHEDULE C.)
I-5 VOCATIONAL TRAINING

1. Has your child had any special job training?

   (INTERVIEWER PROBE)
   ___ in regular school
   ___ in vocational school
   ___ special education classes in regular school
   ___ in vocational school for the handicapped
   ___ in sheltered workshops

2. (IF YES) Where did you go to get this training? (FILL OUT SCHEDULE A OR B.)

3. Is there any special work-related training that you thought might have been useful for your child but that for some reason you could not or did not get?

4. Do you think your child will need vocational training at some time in the future? (IF YES, FILL OUT SCHEDULE C.)
1. Has your child ever wanted to find part-time or full-time work?

2. (IF YES) Did he have any trouble finding work?

3. Was his difficulty in finding work related at all to his impairment?

4. Did his teacher at school or his vocational training counselor try to help him find the job?

5. Did he use a placement service?

   (INTERVIEWER PROBE)
   ___ for normal persons
   ___ for handicapped persons
   (IF YES, FILL OUT SCHEDULE A OR B.)

6. WORK EXPERIENCE

   a. Has your child ever held a full-time or part-time job?
      (What fraction of time?)
   b. What sort of job(s)? Was he paid?
   c. How long did he work there?
   d. Did he have any difficulty on the job that you think was the result of his impairment?
   e. Did he like the job?
   f. Why did he leave the job?

7. Do you think your child ever needed job placement services that for some reason you could not or did not get?

8. Do you think your child will need job placement services in the future? (IF YES, FILL OUT SCHEDULE C.)
I-7 COUNSELING

1. Have you or your child ever used counseling services to help understand the problems connected with hearing or vision impairment?
   ___ visit by social worker of any sort?
   ___ visit by agency personnel?

2. Where did you (or he) go to get these services? (FILL OUT SCHEDULE A OR B.)

3. Have you or your child ever felt the need for counseling but for some reason you could not or did not get it?

4. Do you think you or your child will need counseling at some time in the future? (IF YES, FILL OUT SCHEDULE C.)

I-8 TRANSPORTATION

1. Have you ever received help transporting your child to his classes, doctor, etc.?
   (INTERVIEWER PROBE)
   What is the farthest you've ever had to go to get some service?
   What sort of transportation do you usually use to get to service agencies?
   ___ own auto
   ___ friend's or relative's auto
   ___ public transportation

2. Has a service agency ever offered or given you help in transporting your child or yourself to the agency? (IF YES, FILL OUT SCHEDULE A OR B.)

3. Have you ever wanted help transporting your child to an agency but for some reason you could not or did not get that help?

4. (FOR BLIND OR PARTIALLY-SIGHTED ONLY) Has your child ever received mobility training? (IF YES, FILL OUT SCHEDULE A OR B.)

5. Have you ever had to do without some service altogether, or get less service, because you could not get to the agency?

6. Do you think at any time in the future you will need help transporting yourself or your child to a service agency? (IF YES, FILL OUT SCHEDULE C.)
I-9 RECREATION

Let's talk a bit about your child's social and recreation needs.

1. Does he often have a chance to meet and play with persons his own age? How often?
   
   (INTERVIEWER PROBE)
   __normal children?
   __children with similar impairments?

2. Does your child belong to any clubs or youth groups? Church groups? Community organizations? How many? Which ones?

3. Does your child participate in any sports? What sports? How often?
   
   (INTERVIEWER PROBE)
   __with normal children?
   __with special allowances for his handicap?
   __with other children who have impairments?

4. Has any service agency or organization of the handicapped ever offered a program to provide your child with special opportunities for socializing with others, either normal or handicapped? (IF YES, FILL OUT SCHEDULE A OR B.)

5. Have you ever felt that your child needed more opportunities for recreation or socializing that for some reason he could not or did not get?

6. Do you think your child will experience special social or recreational needs in the future? (IF YES, FILL OUT SCHEDULE C.)
I-10 FINANCES

1. Have you ever received help financing your child's special service needs?

2. Where did you go to get this help? What portion of the cost is paid by each source—some, most, all?
   ___ friends or relatives
   ___ bank loan
   ___ welfare programs
   ___ other

3. Have you ever needed help with financing these service needs that for some reason you could not or did not get?

4. Do you think that, at some time in the future, you will need additional help financing your child's special service needs?

5. Do you think your child, at some point in his life, will need financial help providing either for his daily needs or for his special service needs?
II-1 RANKING OF NEEDS

1. We have been talking, now, about ten different kinds of needs that you or your child might have felt. Looking at the list again (INTERVIEWER SHOW CARD B), could you tell me which is your most important need right now—that is, getting or not getting which of these things would make or does make the most difference in your child's life?

   Medical treatment
   Special equipment
   Personal care
   Education
   Vocational training
   Job placement
   Counseling
   Transportation
   Recreation
   Financial aid

2. Which service need would you rank second? Third? Last?

3. On a scale of 1 to 10 (INTERVIEWER SHOW CARD B), how important has each service been for your child? A rating of 0 might mean that the service has had no effect on the quality of his life, while a rating of 10 would mean it has had a very beneficial effect.

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(IF "0", INTERVIEWER PROBE)

   —no effect, or negative?
   —how negative?
II-2 GENERAL EVALUATION OF SERVICES

1. Overall, have you been pretty well satisfied with the services that you have been offered or have been able to get?

   (INTERVIEWER PROBE)
   ___Have you been able to get enough service usually?
   ___Have you been offered the right kinds of services—tailored to your own special needs?
   ___Were the services worthwhile? Or a waste of time?
   ___Anything else?

2. Overall, do you think the services you have used have improved the quality of your child's life? How much difference have they made? (SHOW CARD A.)

3. Overall, do you think the services you have used have improved the quality of life for your whole family? A lot or a little? In what ways?

4. Overall, how much difficulty have you had finding out what services are available and where to go to get them?

II-3 ROLE OF GOVERNMENT

There are a number of different ways in which the government can help people with impaired vision or hearing get the services they need. I'd like to ask your opinion of some of them.

1. Would you like an insurance-type system (like Social Security or unemployment insurance) where everyone pays in, and then those who are impaired by an accident or from birth get the services they need?

2. Would you like getting vouchers from the government to get services from a private or public source of your own choosing?

3. Would you like the government to provide you only with information about where to go for various services (but not to provide the services or pay for them)?

4. Would you prefer getting services from groups that are not connected with the government—like doctors or private clinics—rather than from the government?

5. Are there any areas where you think the government should get out of the business of providing services?
III-1 SEVERITY OF IMPAIRMENT (VISUAL)

1. Is your child classified as legally blind?

2. Is he totally blind in one eye? Or in both eyes? Any residual vision?

3. Does he wear glasses?

4. Can he walk in unfamiliar surroundings without help?

5. Can he walk in unfamiliar surroundings using a cane or guide dog?

6. Can he walk in unfamiliar surroundings only if a sighted person helps him?

7. Can your child read and/or write yet?

   (INTERVIEWER PROBE)
   __Braille
   __regular print
   __large print
   __handwriting
   __typing

8. If so, what sorts of visual aids does he need in order to do so?

9. What is his primary method of reading? Does he use tapes, talking books, or a sighted person who reads to him? (IF YES) How often does he use these aids?

10. Can he recognize a familiar face? From how far away?

11. Can he discern light and shadow? Color?

12. Can he watch movies? TV? Sports events?

13. Does he seem to get along well with other children his own age?
IV-1 SEVERITY OF HANDICAP (HEARING)

1. Is your child's hearing impairment
   ___ mild?
   ___ moderate?
   ___ severe?
   ___ profound?

2. Do you know the decibels (dB) of hearing loss?

3. How well can he understand speech using his hearing only
   (without lip reading, but with a hearing aid if necessary)?
   ___ can understand most words and sentences
   ___ can understand a few words and phrases
   ___ can understand a few sounds and occasional words

4. Is your child able to talk?
   ___ relatively easy to understand
   ___ can say a few phrases
   ___ can say a few words
   ___ can make nonverbal sounds
   ___ cannot speak

5. Did your child learn to speak before his hearing was impaired?

6. Does your child read lips? How well?

7. Does your child use sign or finger spelling? (IF YES) On an
   ordinary day, how often does he use sign or finger spelling
   as compared with speaking?

8. Does his hearing problem make it difficult or dangerous for
   him to get around in unfamiliar surroundings?


10. Does he seem to get along well with other children his own
    age?

IV-2 And now, a few wrap-up questions:

1. How many persons live here with you?

2. How many children? How many adults?

3. How long have you lived in this residence?

4. Where did you live before that? For how long?
V-1 FOR INTERVIEWER TO FILL OUT

1. Respondent's address:
   Street or RR No. __________________________
   City, Town, etc. __________________________
   County __________ State ______ Zip code ______

2. Respondent's area: ______ Urban ______ Suburban ______ Rural

3. Respondent's sex: ______ Male ______ Female

4. Respondent's age: ______

5. Respondent's race or ethnic background: ______ Black
   ______ Indian
   ______ Oriental
   ______ Spanish American
   ______ White
   ______ other (SPECIFY) ______________________

6. Cooperativeness during interview: ______ mostly uncooperative
   ______ sporadically uncooperative
   ______ mostly cooperative

7. Interruptions during interview: ______ many
   ______ a few
   ______ none

8. Others present during part or all of interview:
   ______ respondent alone
   ______ child(ren)
   ______ husband or wife
   ______ other (SPECIFY) ______________________
9. Interviewer's assessment of parent's attitude toward handicap:

10. Interviewer's assessment of parent's socioeconomic status:

_________________________ Educational level of respondent

_________________________ Educational level of spouse

_________________________ Occupation of respondent

_________________________ Occupation of spouse

_________________________ Income

_________________________ Class ranking
Schedule A

SERVICES CURRENTLY IN USE

1. What is the name of the agency?

2. Where is it located (city)?

3. When did you first go there?

4. How often do you go?

5. What services do you get from them?

6. What happens when you go to the agency? (GET RESPONDENT TO PAINT A VERBAL PICTURE OF HIS EXPERIENCE AT THE AGENCY.)

7. What is your impression of agency personnel?

   (INTERVIEWER PROBE)
   __ competent
   __ well trained
   __ considerate
   __ fair

8. Does your child go with you to this agency? (IF YES) Does he like going?

9. On a typical visit to the agency, how much time do you spend there?

10. How much of this is time spent by agency personnel with your child? How much of it is time spent with you?

11. How did you find out about this agency?

   __ self
   __ other individual
   __ physician or optometrist
   __ hospital
   __ media
   __ welfare agency
   __ school
   __ association for the handicapped
   __ counselor
   __ other (SPECIFY)
12. Did you have to do a lot of searching and asking around in order to find out about the agency?

13. Was it difficult to locate and get to the agency?

14. Did you have to wait a long time for an interview?

15. Did you have to wait a long time for service?

16. Before you went to the agency, did you consider any other ways of getting this service? (IF YES) Why did you select this agency over the others?

17. Were you ever refused service by a similar agency? (IF YES, FILL OUT SCHEDULE D.)

18. If you had been refused service at this agency, what do you think you would have done?

19. Do you have to pay anything for the service? Approximately how much?
   (IF YES) Does it mean a financial hardship for you?
   (IF YES) Would you be willing to pay more for it if you had to?
   (IF NO) Would you still use this service if you had to pay for it?
   (IF NO) Did you have to take a means test in order to qualify to receive the service?

20. If the service were not offered in this city, would you move to another city in order to get it? Did you move in order to get it?

21. How much has the service helped your child? (INTERVIEWER SHOW CARD A.)
   ___ physical skills
   ___ communication skills
   ___ education, training
   ___ social skills
   ___ psychologically (self-confidence, happiness)
   ___ income
   ___ ability to see or hear
   ___ mobility
22. If for some reason you had not been able to get this service, how much difference would that have made in your child's life? (SHOW CARD A.)

23. Has the service been helpful or useful to you in any way?

24. Is the service you're getting pretty much what you expected when you first went to the agency?

25. Do you feel that the service was pretty much what you individually needed?

26. Were you offered any service that you didn't want or need?

27. Do you feel you're getting enough service? Would you like more? How much more?

28. Would you like less service? How much less?

29. In general, do you feel satisfied with the service received?

30. Is there anything in particular that you don't like about the service or the agency.

31. Is there anything in particular that you especially like about the program?

32. If you could change the program in any way that you wanted to, what would you do?
Schedule B

SERVICES USED PREVIOUSLY

1. What was the name of the agency?

2. Where is it located (city)?

3. When did you first use their services?

4. How often did you go there?

5. How long did you continue using them?

6. What services did you get from them?

7. What happened when you went to the agency? Describe it for me.

8. What was your impression of agency personnel?

   (INTERVIEWER PROBE)
   ___competent
   ___well trained
   ___considerate
   ___fair

9. Did your child go with you to this agency? (IF YES) Did he like going?

10. On a typical visit to the agency, how much time did you spend there?

11. How much of this was time spent by agency personnel with your child, and how much was time spent with you?

12. How did you find out about the agency?

   ___self
   ___other individual
   ___physician or optometrist
   ___hospital
   ___media
   ___welfare agency
   ___school
   ___association for the handicapped
   ___counselor
   ___other (SPECIFY)
13. Did you have to do a lot of searching and asking around in order to find out about the agency?

14. Was it difficult to locate and get to the agency?

15. Did you have to wait a long time for an interview?

16. Did you have to wait a long time for service?

17. Before you went to the agency, did you consider any other ways of getting this service?

18. Were you ever refused service by a similar agency? (IF YES, FILL OUT SCHEDULE D.)

19. If you had been refused service at this agency, what do you think you would have done?

20. Did you have to pay anything for the service? Approximately how much?
   (IF YES) Did it mean a financial hardship for you?
   (IF YES) Would you have been willing to pay more for it if you had to?
   (IF NO) Would you still have used this service if you had had to pay for it?
   (IF NO) Did you have to take a means test in order to qualify to receive the service?

21. If the service had not been offered in your city, would you have moved to another city in order to get it? Did you move in order to get it?

22. How much did the service help your child? (INTERVIEWER SHOW CARD A.)
   __ physical skills
   __ communication skills
   __ education, training
   __ social skills
   __ psychologically (self-confidence, happiness)
   __ income

23. If for some reason you had not been able to get this service, how much difference would it have made in your child's life? (SHOW CARD A.)
24. Was the service helpful or useful to you in any way?

25. Was the service you got pretty much what you had expected when you first went to the agency?

26. Was the service pretty much what you individually needed?

27. Were you offered any service that you didn't want or need?

28. Did you feel you got enough service? Would you have liked to have more? How much more?

29. Would you have liked less service? How much less?

30. In general, were you satisfied with the service you received?

31. Was there anything in particular that you didn't like about the service or agency?

32. Was there anything in particular that you especially liked about the program?

33. If you could change the program in any way you wanted to, what would you change?

34. Why did you stop using the service?
Schedule C

PROJECTED SERVICE NEEDS

1. Where do you think you will go to get these services?
   (IF YOU DON'T KNOW) How would you go about trying to find out where to go?
   (IF YOU DO KNOW) Is there any particular reason you would go there instead of some other agency?

2. If you cannot get these services for some reason, do you think it will make a big difference in your child's life?

3. How will these services be paid for?
Interview Number_____  

Schedule D  

REFUSALS  

1. What reason was given for the refusal?  

2. Who referred you to this agency?  

3. Did they refer you to another agency? Which one?  

4. Did you go there? Why or why not?  

5. Do you think it would have made a difference in your child’s life if you had been given service at this agency? How much difference? (SHOW CARD A.)
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Appendix B

STATE VARIATION IN WELFARE PROGRAMS

In Chapter 10 we noted the large variation across states in expenditures and in the number of handicapped persons in Aid to the Blind (AB) and Aid to the Permanently and Totally Disabled (APTD) programs. Although these two programs have been superseded by the Supplementary Security Income program, it was felt that an attempt to explain the wide interstate variations might prove fruitful for planning future open-ended programs. Most of the programs discussed in this report are closed-ended, i.e., the maximum amount to be received by the states from the federal government is set at some specified amount. Under AB and APTD, however, federal expenditures per person receiving aid are specified by a formula, but total program expenditures are "open-ended" in that no ceiling is placed on the number of persons receiving assistance.

This appendix examines factors that may influence these open-ended AB and APTD expenditures. Some past attempts to model and study the determinants of government expenditure patterns are reviewed. The more promising of these models are then tested with data for AB and APTD and found to be of only very limited value as aids to understanding these programs. Finally, we formulate and test a simultaneous equation model. These efforts also led to only limited success in "explaining" the interstate variation. We conclude that the determinants of state and federal expenditures for financial assistance to handicapped persons under the AB and APTD programs are too complex to be well understood using currently available data and econometric models.

REVIEW OF LITERATURE

The original article in the discussion of factors affecting interstate differences in the level of government expenditures was written by Fabricant in 1952. He examined, in a multiple regression model framework, the determinants of state and local governmental expenditure patterns for 1942. The expenditure patterns were "explained" in terms of income, degree of urbanization, and population density.

The publication by the United States Bureau of the Census of extensive data on expenditure patterns by state and local governments, particularly the 1957 Census of Governments, provided the impetus for an expanded look at this field. While early studies attempted to replicate the Fabricant findings, work by Sacks and Harris made a substantial contribution by raising the issue of the role of federal aid in determining state and local expenditure patterns. In effect, this article changed the focus of work in this field. Previous studies concentrated on the issue of explaining and predicting state and local expenditure patterns. With the introduction of federal aid as a major explanatory variable the analysis became more policy relevant. As


Bahl and Saunders\(^3\) noted, determinants studies have provided an objective test of the capability of federal matching shares to achieve minimum national standards at lower federal tax costs. The Sacks and Harris approach was extended in 1966 by Osman.\(^4\) Osman developed a model which he said enabled one to estimate whether or not federal aid was stimulative or substitutive in its effects on state and local expenditures. In addition, he considered the cost effect of federal aid in one area on expenditures in a seemingly unrelated area. The basic model used by Sacks and Harris and by Osman had as its dependent variable total expenditures by state and local governments for a given function, and included federal aid among the independent variables. This approach was criticized by several authors on at least two grounds. First, regressing total expenditures which included federal aid against federal aid would, in fact, create a biased result (for example, see Morss).\(^5\) Second, the direction of causality was not clear and it was quite possible that instead of federal aid explaining state and local expenditures, state and local expenditures, because of the open-endedness of federal aid programs, could be used to explain federal aid. Pogue and Sgontz\(^6\) showed that many of the same variables used to "explain" variations in state and local expenditures have a high degree of "explanatory" power if applied to variations in federal aid by state. Accordingly, Horowitz\(^7\) removed the entire argument from the realm of a single equation, ordinary least squares regression model, and argued that because of the simultaneous nature of the system, particularly those factors that determine federal aid, the best approach would be to use the techniques of two-stage least squares regression models. In 1968, Osman\(^8\) replied on both counts. He pointed out that in most cases, with the exception of welfare, federal aid programs are in fact closed-ended. He felt, a priori, that it might be argued that strong pressure exists for a state to use all the funds apportioned to it. If such pressure exists, the amount available to a state determines the amount of aid it receives. It was argued that, since the amount apportioned appears to be largely free of feedback, the amount of aid received will also be free of feedback.

That is, it will be an independent variable. Available statistics bear out this hypothesis. Osman concluded that federal aid is determined by forces outside the state and may be used as an independent variable. Osman went on to argue, however, that the same situation may not hold for welfare payments. There is no ceiling on total welfare expenditures and the terms of the federal program come close to making it an open-ended grant program. However, federal participation is open-ended only with respect to the ability of the state to enroll new program recipients, not with respect to payments per recipient. A second point raised by Morss,\(^9\) that of "correlating changes in a variable with components in its variable," was also dealt with by Osman. He pointed out that subtracting aid from the total state and local expenditure variable simply reduces the coefficient on the aid variable by 1.0. Similarly, he

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found that regressing state and local expenditures less federal aid, on the federal aid variable, within a multiple regression model still resulted in federal aid being a statistically significant determinant of state and local expenditures.

Further work by O'Brien concluded that grants and expenditures were not simultaneously determined. O'Brien's dependent variable was "net of federal grants" and therefore represented "expenditures from own funds." He concluded that ordinary least squares, two-stage least squares, and generalized least squares methods provided consistent estimates. Because two-stage least squares estimates of the grants coefficients were not significantly lower than the ordinary least squares estimates, he concluded that grants and expenditures are not simultaneously determined and that grants are an exogenous variable in the determination of expenditures.

APPLICATION OF EARLIER MODELS TO THE AB AND APTD PROGRAMS

With respect to our study, it was hoped that variables found in other earlier studies to "explain" state expenditure patterns would be relevant to the problem of "explaining" the variations in expenditure patterns for AB and APTD.

Three of the more promising models from studies we have just reviewed were tested using 1970 data on AB and APTD.

Our principal measure of the level of state AB and APTD assistance, as indicated, will be state expenditures for financial assistance. In doing this we exclude counseling and other services offered by state public welfare agencies. The availability of data dictates this decision. Data on assistance are reported separately while data on services are lumped with state expenditures for administration and training. In addition, because of potential overlap in the eligible populations for AB and APTD, data from these programs are pooled and considered as one welfare program for the handicapped. By doing this, we hope to avoid the problem of an individual who, for example, would qualify for AB in one state, but APTD if he lived in another state.

All of the models reviewed earlier dealt with total public assistance expenditures per capita. That is, they considered public welfare to include the entire program of administration, service, training, and assistance expenditures for AB, APTD, Old Age Assistance (OAA), and Aid to Families with Dependent Children (AFDC). As a first step, we tested three models with a subset of the public welfare data—data on financial assistance payments for state AB and APTD programs.

The first of the state expenditure models was Fabricant's. The model he developed to explain per capita state expenditures contained three variables: per capita income, population density, and percent urban. Based on 1942 data, his model of per capita public welfare expenditures is as follows:

\[ E = -1.99 + 0.0072 I + 0.1835 U - 0.0212 D \]

where
\[ E \] = per capita expenditures for public welfare
\[ I \] = per capita income 1938-42
\[ U \] = urbanization, the percentage of the population in communities of over 2,500 in 1940
\[ D \] = population density per square mile.

Using this structural form, but substituting data for 1970, we get a low $R^2$, a coefficient of determination of 0.32, and none of the variables were statistically significant using a t-statistic test, indicating the model is unsatisfactory when applied to AB and APTD.

The low $R^2$ is consistent with the results reported by Sacks and Harris. They found that, as federal aid became a larger and larger part of the welfare program over time, this particular model increasingly failed to explain the level of state expenditures. Sacks and Harris expanded the basic Fabricant model, adding federal aid to the states as a variable. Their model for per capita public welfare expenditures is as follows:

$$E = 17.70 + 1.071 - 0.023U + 0.003D + 1.683F$$

where $E$, $I$, $U$ and $D$ are as before and $F$ is per capita federal aid to welfare. This structural form applied to 1970 AB and APTD data also gave unsatisfactory results comparable to those obtained with the Fabricant model. In an attempt to further refine these models, Osman and others added various socio-economic variables and selected population variables. The welfare function which Osman finally accepted contained only three variables—percent urbanization, percent of population over 65, and per capita federal aid to welfare. In equation form, this is as follows:

$$E = -18.00123 + 0.21422U + 1.29032A + 1.37649F$$

where $E$, $U$ and $F$ are as before and $A$ is the percent of population 65 years of age and over. Using this structural form and 1970 AB and APTD data, we again obtained unsatisfactory explanatory results.

These three models are representative of the ordinary least squares (OLS) approach to studying the determinants of state expenditures. From our standpoint, they appear to be of little use for several reasons. First, the low $R^2$'s and insignificant variables indicated by the t-test suggest that the models are not well-specified with respect to our problem. They provide no firm explanations of the variations in state expenditures for welfare to the handicapped. Second, from the standpoint of federal policy, they are of little help. The independent variables are, in general, factors beyond the control of federal policy. Third, OLS is not an appropriate tool when the problem is one of joint determination; it will yield unbiased estimates only when all explanatory variables are exogenous. Based on the formula for the federal proportion of state AB and APTD welfare payments, we feel that the problem is one of joint determination. In an OLS system there is no accounting for the interaction of the expected level of federal participation with the state decision of payment level and numbers served. This interactive process can be dealt with in a two-stage least squares regression model.

Little has been done, however, with two-stage least squares (TSLS) regression models. Horowitz and O'Brien published two studies attempting a simultaneous equation estimate of grants and expenditures. Horowitz used a TSLS approach to study interstate differences in state and local expenditures and employment. In her model, per capita expenditures, tax effort, income distribution, and federal grants were determined simultaneously. The principal findings were:

1. The higher the level of per capita personal income the higher are per capita state and local government expenditures.

11 Using the same structural form as Fabricant, Sacks and Harris found using 1957 and 1960 data, $R^2$'s of .14 and .11, respectively.
2. There is a positive relationship between tax effort and the amount of public goods and services provided.
3. When the effects of federal aid are held constant there are neither economies nor diseconomies associated with per capita public expenditures.
4. For states with the same per capita income, tax effort, and distribution of income, state and local expenditures per capita will differ by $1.26 for each difference of $1 in per capita federal grants-in-aid.

O'Brien's study looked at whether grants and expenditures were determined simultaneously and whether federal funds stimulate or substitute for state and local expenditures. With his model he found that the OLS and TSLS estimates of the grants coefficients were not significantly different. From this result, specific to the model he used, he concluded that, in general, grants and expenditures are not simultaneously determined. We argue that while this could well be true for the closed-ended programs, the conclusion is inconsistent with the formula used in the open-ended programs. Taking a cue from Horowitz's work, we developed a model thought to be more appropriate to the questions of concern to us.

A SIMULTANEOUS EQUATION MODEL OF AB AND APTD EXPENDITURES

In our model, federal expenditures (FC), state expenditures (SC) and number of recipients (N) are the three endogenous variables that are determined simultaneously. SC is assumed to be a linear function of FC, N and state revenue (R). Federal cost is taken as a linear function of SC, N and per capita income (Y). These variables, by statute, determine the amount of federal aid to a state. N is assumed to depend on SC, Y and the state disabled population (D). Using this structural form and data from 48 states, the estimated coefficients in the second stage are as follows:

\[
\begin{align*}
FC &= -5686 - 4517 \text{ SC} + 6934 \text{ N} + 1549 \text{ Y} \\
     &\quad (-3.770) \quad (10.89) \quad (2.074) \\
SC &= -561.9 - 1681 \text{ FC} + 0.8423 \text{ N} + 4.535 \text{ R} \\
     &\quad (-2.737) \quad (2.191) \quad (3.040) \\
N &= 22,580 + 0.9738 \text{ SC} + 0.045 \text{ D} - 5.931 \text{ Y} \\
     &\quad (6.558) \quad (6.674) \quad (-4.293)
\end{align*}
\]

The reduced form equations are as follows:

\[
\begin{align*}
FC &= 10,650 - 2.840 \text{ Y} + 1.825 \text{ R} + 0.0254 \text{ D} \\
     &\quad (-2.676) \quad (2.073) \quad (3.416) \\
SC &= 3055 - 1.236 \text{ Y} + 8.163 \text{ R} - 0.0262 \text{ D} \\
     &\quad (-1.242) \quad (9.888) \quad (-3.764) \\
N &= 25,550 - 7.135 \text{ Y} + 7.950 \text{ R} + 0.0195 \text{ D} \\
     &\quad (-3.543) \quad (4.758) \quad (1.385)
\end{align*}
\]

To talk about the interactive effects we look first at the results of the second stage equations. To discuss the net effects, we will then look at the reduced form equations.

\[12\text{ Nevada was excluded because it had no APTD program, and California was excluded as a statistical outlier that would significantly distort the coefficient estimates.}\]
The variables in the federal cost equation are those in the formula used to determine the amount of federal reimbursement. For the first $37 of the average grant, the federal government paid the states $31. From $38 to $75, if the grant was that high, the federal government paid a varying portion depending on state per capita income. Beyond $75 the total cost of the grant was born by the state. In 1970, state average grants for AB and APTD were all above the $37 level, and most were above $75. Therefore, for an increase in program assistance costs due to an increased average grant, federal cost would increase if the grant was in the range $38 to $75, but above $75, federal cost would not change. If, however, program costs increased due to increased numbers of recipients, holding the average grant constant, federal cost would increase by the change in N times the federal share. We would expect, on the basis of the grant formula, that $\frac{\partial FC}{\partial SC}$ would be greater than zero. That it is less than zero suggests that as state average grants increased beyond $75, this increase was related to higher per capita income. This higher per capita income in turn reduced the federal share and so would explain the result, which was that $\frac{\partial FC}{\partial SC}$ was less than zero.

The federal share of the amount of the assistance payment between $38 and $75 is a function of state per capita income. That is, as state per capita income increases relative to average state per capita income, the federal share is supposed to decrease. We would expect, therefore, that the change in federal cost due to a change in state per capita income, with SC and N held constant, to be less than zero. In our second stage, however, $\frac{\partial FC}{\partial Y}$ is positive. This could be due to the fact that the federal percentage is subject to two calculations. The first is related directly to per capita income and program expenses. This is known as the regular formula. The second, the alternate formula, while also a function of per capita income, allows states operating an approved plan for medical assistance (Title XIX) to use the "federal medical assistance percentage." If a state uses the regular formula, only the first $75 of the average grant is eligible for reimbursement. The federal percentage is applied to the portion between $38 and $75. Maximum federal participation is $75 times the number of recipients in the program. If a state uses the alternate formula, however, it is allowed to pool the assistance payments made for OAA, AB, APTD and AFDC and there is no maximum for the federal share to be paid on these assistance categories. (The maximum under the regular formula is 83 percent). In effect then, the basis of the state reimbursement formula can be raised by pooling the payments in the programs of interest to us with those for OAA and AFDC. The effect of per capita income on federal cost could be dominated by the total of the programs subject to the "federal medical assistance percentage." That is, as per capita income increases, we would expect the "federal medical assistance percentage" to decrease. But if this decrease is small, or if there is no change at all due to national increases in per capita income, it would be expected that if increased per capita income leads to a larger state welfare program in total, federal cost would increase in total and by type. One implication of this hypothesis is that the elasticity of federal cost with respect to per capita income will be less than one. We can test this implication by referring back to the reduced form equations. We find that in fact the elasticity of federal cost with respect to per capita income is less than one. In addition, if this hypothesis is true, we would expect the elasticity of state cost with respect to per capita income to be greater than the elasticity of federal cost with respect to income. For a typical state, e.g., Minnesota, where per capita income is about equal to the national average per capita income, the ratio of these two elasticities is less than one, supporting our hypothesis.

These two results, the opposite signs of both $\frac{\partial FC}{\partial SC}$ and $\frac{\partial FC}{\partial Y}$, suggest that the welfare program cannot be studied in isolation from the provisions of Title
XIX. A more complete specification of the interrelations of all assistance programs is required. This suggests, in addition, that before proposing changes in money assistance payments there must be an understanding of how federal and state payments will be affected by the various formulas used to compute federal reimbursement.

The remaining relationships in the equation system are as would be predicted. Given the open-ended program and the formulas for federal reimbursement, the signs of \( \delta FC/ \delta N \) and \( \delta SC/ \delta N \) are as expected. That is, as the number of recipients increases, and given an unchanged average payment level, we would expect an increase in program costs and hence an increase in both state and federal costs.

The sign of \( \delta SC/ \delta R \) is positive. This result is consistent with the expectation that "wealthier" states, those with larger revenues, would have larger assistance programs both in terms of numbers of recipients and average grants. Together, these factors lead to increased program cost and hence to both increased state and federal costs of supporting the program.

The positive sign on \( \delta N/ \delta SC \) implies that increased program expenditures go not only to increased payment levels but also to an increased number of recipients. Total program costs, and hence state cost, can increase either due to increased numbers of recipients or increased payment levels.

We would expect the number of recipients to vary directly with the eligible population. Thus the sign of \( \delta N/ \delta D \) is as expected. With respect to per capita income, using this aggregate measure, it would be expected, that as per capita income increased, average grant size would increase, and the number of recipients would decrease. That is, given the income requirements of a welfare program, as per capita income increases, fewer people meet the income requirements for AB and APTD.

Considering the two coefficients for \( N \) together suggests that the burden of the cost of an additional recipient falls more on the state than on the federal government. This would appear to be true at high payment levels. If the grant were $150, for example, and the state used the regular formula with a federal percentage of 50 percent, an additional recipient would cost each government as follows:

<table>
<thead>
<tr>
<th>Grant</th>
<th>State Share</th>
<th>Federal Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0 — $37</td>
<td>$ 6</td>
<td>$31</td>
</tr>
<tr>
<td>$38 — $75</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>$75 — $150</td>
<td>75</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>$100</td>
<td>$50</td>
</tr>
</tbody>
</table>

In other words, the state would bear two-thirds of the cost, the federal government one-third. Such a burden could well be too great for the state and serve to discourage any outreach efforts.

The net effects, as shown by the reduced form equations, have already been discussed in terms of the relationships between federal cost, state cost, and per capita income. The positive sign on \( R \) in every equation of the reduced from supports our earlier statement that higher state revenues lead to larger programs, both in terms of payments and recipients and hence to increased state and federal costs. The one anomaly in the system is the negative sign on \( D \) (state disabled population) in the state cost equation. While its contribution is small, the coefficient is significant.

The difference of our results in some cases from what would have been predicted a priori suggests immediately that the system is not as simple as it has been specified in the model. More important, the influence of the reimbursement formulas is apparent but not captured completely in the model. In addition, because the welfare alternate formula is tied to other than welfare payments we cannot look at welfare
alone; state reimbursement for this activity is tied to state payments for medical assistance, for example.

Finally, unlike other determinants models, this is not a per capita model. We tested a closely related simultaneous equation per capita model, but none of the variables had high statistical significance. Hence, we feel that more research is required to develop better models, and to supplement currently available data to make it feasible to use those better models. Consequently, we draw no policy conclusions from the analyses in this appendix.