

**A REPORT ON THE FEASIBILITY
OF ESTABLISHING A SCHOOL OF OPTOMETRY
IN THE COMMONWEALTH OF VIRGINIA**

**A SPECIAL REPORT TO
THE GOVERNOR
THE GENERAL ASSEMBLY**



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A special report prepared in response to Senate Joint Resolution No. 1 which directed the State Council of Higher Education for Virginia to consider and report on the need for establishment of a school of optometry in the Commonwealth.

TABLE OF CONTENTS

	Page
LIST OF TABLES	i
LIST OF FIGURES	iii
FORWARD	v
INTRODUCTION	1
BACKGROUND FOR THE STUDY	3
MANPOWER DISTRIBUTION AND RATIOS	11
VISION CARE EDUCATION	25
DEVELOPMENT OF AN OPTOMETRY SCHOOL	51
REGIONAL COOPERATION	57
SUMMARY	59
CONCLUSIONS AND RECOMMENDATIONS	63
FOOTNOTES	67
APPENDICES	
A Statement on New Schools and Colleges of Optometry .	69
B Optometry School Study Committee List of Contacts .	71
C Providing Assistance	73
BIBLIOGRAPHY	75

TABLES

		Page
TABLE 1	OPTOMETRISTS/POPULATION RATIOS, AND OPHTHALMOLOGISTS/POPULATION RATIOS	13
TABLE 2	ACTIVE OPTOMETRISTS IN THE S.R.E.B. STATES - 1973	15
TABLE 3	HISTORICAL VIRGINIA RATIOS	16
TABLE 4	OPTOMETRISTS, POPULATION, RATIO OF PERSONS PER OPTOMETRIST AND OPTOMETRISTS NEEDED BY PLANNING DISTRICT	20
TABLE 5	NUMBER AND PERCENT OF ACTIVE OPTOMETRISTS, 1972	21
TABLE 6	OPHTHALMOLOGISTS, POPULATION, RATIO OF PERSONS PER OPHTHALMOLOGIST, AND OPHTHALMOLOGISTS NEEDED BY PLANNING DISTRICT	23
TABLE 7	PRESENT SCHOOLS OF OPTOMETRY IN THE UNITED STATES	27
TABLE 8	ENROLLMENT: SCHOOLS OF OPTOMETRY 1974-1975	28
TABLE 9	INSTRUCTIONAL EXPENDITURES PER STUDENT 1971-1972	29
TABLE 10	GRADUATES OF OPTOMETRY SCHOOLS IN THE UNITED STATES	30
TABLE 11	VIRGINIANS ENROLLED IN SCHOOLS OF OPTOMETRY 1974-1975	33
TABLE 12	TUITION FEES FOR 1974-1975	35
TABLE 13	VIRGINIA RESIDENTS IN OPTOMETRY SCHOOLS IN 1975, BY YEAR OF SCHEDULED GRADUATION 1974-1975	36
TABLE 14	OPTOMETRY SCHOOL CONTRACT POSITIONS NOT CURRENTLY ASSIGNED TO SPECIFIC STATES	40
TABLE 15	OPHTHALMOLOGY RESIDENCIES: NATIONWIDE	44

TABLES (continued)

TABLE 16	PRESENT AND PROJECTED OPHTHALMOLOGY RESIDENCIES IN VIRGINIA	45
TABLE 17	EDUCATIONAL PROGRAMS, NATIONALLY, FOR OPTO- METRIC AUXILIARY PERSONNEL	
TABLE 18	SUPPLEMENTARY PERSONNEL EMPLOYED BY OPTOME- TRISTS IN VIRGINIA, 1972	49
TABLE 19	POTENTIAL LOCATIONS FOR NEW SCHOOLS OF OPTOME- TRY - Academic Health Science Centers Located in Urban Areas of 200,000 or More	52
TABLE 20	CONSTRUCTION COSTS: SCHOOL OF OPTOMETRY	54
TABLE 21	BUILDING REQUIREMENTS: SCHOOLS WITHOUT GRADUATE PROGRAMS	56
TABLE 22	ADDITIONAL NUMBER OF OPTOMETRY STUDENT PLACES REQUIRED PER YEAR 1973-1990 TO ACHIEVE NATIONAL AVERAGE BY 1990*	59

FIGURES

FIGURE 1	CRITICAL SHORTAGE AREAS: OPTOMETRISTS-1973	17
FIGURE 2	OPTOMETRISTS-1973	18
FIGURE 3	RESULTS OF EXAMINATIONS OF STATE BOARD OF OPTOMETRY AND THE NUMBER ESTABLISHING A PRACTICE IN VIRGINIA, 1958-1973	38

FOREWORD

In 1970 the General Assembly of Virginia delegated to the State Council of Higher Education for Virginia the responsibility for "planning and coordinating all post-secondary educational programs for all health professions and occupations" (Code of Virginia, § 23-9.10:1a).

In 1974 the General Assembly approved Senate Joint Resolution No. 1 which directed the State Council of Higher Education to consider and report on the need for establishment of a school of optometry in the Commonwealth. The present report is the Council's response to the General Assembly directive.

The Council would like to take the opportunity to thank each of the members of the Optometry School Study Committee who assisted in the development of this report. The members of this Committee are as follows:

John A. DiBiaggio, D.D.S., Richmond, Chairman
 William R. Baldwin, O.D., Ph.D., Boston, Massachusetts
 John B. Caldwell, M.D., Richmond
 Honorable Orby L. Cantrell, Pound
 Harold L. Friedenberg, O.D., Richmond
 Margaret B. Inman, Alexandria
 Howard B. Kahn, O.D., Virginia Beach
 Roderick Macdonald, M.D., Richmond
 Senator Paul W. Manns, Bowling Green
 Michael J. Obremsky, O.D., Annandale
 Harry B. Taylor, Jr., M.D., Norfolk
 Luther W. White, III, Ph.D., Ashland
 Lauren A. Woods, M.D., Ph.D., Richmond (ex-officio)

The twenty-seven individuals and organizations listed in Appendix C also assisted the research of the Optometry School Study Committee. The Council would like to provide a note of special thanks to Thomas Mou, M.D., Provost for Health Sciences of the State University of New York for his guidance in the development of the study design and to J. William Doswell, Director of the Virginia Optometric Association for his help in the identification of reference sources.

In addition, I wish to thank Dr. Larrie Dean who directed the study and Mrs. Brenda Edwards for her contributions to the research effort. Finally, Mrs. Melva Carle, Miss Diane Jennings, Mrs. Fran Johnson, and Mrs. Denise Vollmer are to

be thanked for their clerical and typing activities which contributed greatly to the production of this report.

Daniel E. Marvin, Jr.
Director

INTRODUCTION

In order to meet the health care needs of the citizens of the Commonwealth of Virginia, it is necessary to provide adequate educational facilities for training the needed health care personnel.

At present, the student pursuing an education in many health care areas can obtain his education from an institution within the Commonwealth. One health care area for which students must currently seek an education outside of the State is optometry.

With the foregoing in mind, the 1974 Session of the General Assembly directed that a study be undertaken to evaluate the feasibility of establishing a school of optometry in Virginia.

The purpose of this paper, then, is to report on the feasibility of establishing a school of optometry in the Commonwealth of Virginia. An ancillary purpose is to determine the most efficient and effective means of educating the vision care personnel needed to provide services required by Virginians.

BACKGROUND FOR THE STUDY

In order to understand the context in which this study is being undertaken, it is necessary to briefly describe the role of the State Council of Higher Education for Virginia in health sciences education.

Council of Higher Education's Role in Health Sciences Education

The State Council of Higher Education for Virginia has the responsibility of ensuring that quality public higher education is available to the citizens of the Commonwealth. The Council's responsibilities in the area of education in the health sciences were specified by the 1970 Session of the General Assembly.

Mandate

The Council was delegated the responsibility for "planning and coordinating all postsecondary education programs for all health professions and occupations" (Code of Virginia, §23-9.10:1a). Additionally, the General Assembly directed the Council to ensure that education programs for health professionals existed which would provide an adequate supply of health manpower within the Commonwealth. To assist the Council in undertaking these responsibilities, the General Assembly specified that a Committee on Education for Health Professions and Occupations be established and that a staff person be available to aid the Committee in its review and research activities.

As the Advisory Committee on Education for Health Professions and Occupations began its review of proposed academic programs to train health professionals, the Committee found that it lacked adequate information to determine the extent to which various categories of health professionals were required to meet the existing demand for health services.

Health Manpower Studies

A preliminary study in the area of medical laboratory sciences and a background study to determine the availability of guidelines for determining needed health manpower were conducted in 1972.

Funding. In 1973, the General Assembly provided funds which enabled the Council of Higher Education for Virginia to employ a full-time professional staff to develop an information system for health manpower educational planning within the State. Under the guidance of this staff and with the involvement of approximately 130 citizens of the Commonwealth, studies were undertaken which examined dental manpower, pharmacy manpower, existing educational programs in two- and four-year institutions of higher education, the employment patterns of various health manpower categories in acute care and extended care facilities, and a report which examined optometric manpower. The Health Manpower Study: Optometry Manpower was released by the Council of Higher Education in May 1974. The Council staff is presently engaged in refining a procedure to be used in the ongoing assessment of health manpower required. Additional Council health manpower activities are focused on both an analysis of physician, nursing and allied health manpower, and the collection of basic data on educational programs located in health care facilities and educational institutions within the Commonwealth.

Optometry Manpower Study

In undertaking an examination of optometry manpower, the Council was assisted by an Optometry Manpower Study Committee and representatives of the Division of Physician and Health Professions Education of the Bureau of Health Resources Development.

Committee. The Members of the Optometry Manpower Committee, which assisted in preparing the Health Manpower Study: Optometry Manpower, were as follows:

Howard B. Kahn, O.D., Virginia Beach, Chairman
Frederick U. Baublitz, O.D., Martinsville
Harold L. Friedenberg, O.D., Richmond
James S. Fowler, O.D., Waynesboro
Charles Litton, O.D., Norton
Michael J. Obremskey, O.D., Annandale
Henry B. Peters, O.D., Birmingham, Alabama
James R. Prince, O.D., Kilmarnock
J. William Doswell, Richmond (ex-officio)

Objectives. The major emphasis of the Optometry Manpower Study was upon optometrists, although auxiliary personnel and their utilization and training were briefly examined. The principle objectives of the Optometry Manpower Study were to determine the availability and characteristics of optometrists in Virginia, the extent to which optometrists and other vision care personnel were required to meet current demands for service, and the approach or approaches to be utilized to ensure the availability of properly educated manpower to provide visual care services.

Findings and Recommendations. When all factors were considered, including attrition resulting from age, number of Virginians currently enrolled in schools of optometry, and current in-migration of optometrists from other states, it was determined that the supply of optometrists in 1980 will have declined from the current 290 (1972) population to 275. Taking into consideration the same factors, the supply of optometrists in 1990 was predicted to be 253.

Using an optometrist-to-population ratio of 1:14,600, it was projected that Virginia would have a deficit of 95 optometrists in 1980 and 177 optometrists in 1990 and would thus experience both a deficit and an absolute decline in the number of practicing optometrists through 1990.

Those preparing the report on optometric manpower presented a series of eight operational alternatives which the Commonwealth could utilize to educate and train the manpower necessary to meet the vision care needs of Virginians. They are as follows:

Operational Alternative A

Ophthalmology residency programs

Operational Alternative B

Ophthalmology residency programs plus
Contracts for student places in
optometry schools

Operational Alternative C

Ophthalmology residency programs plus
Contracts for student places in
optometry schools plus
Technical education programs for
optometric auxiliaries

Operational Alternative D

Ophthalmology residency programs plus
Regional school of optometry

Operational Alternative E

Ophthalmology residency programs plus
Regional school of optometry plus
Technical education program(s) for
optometric auxiliaries

Operational Alternative F

Ophthalmology residency programs plus
School of optometry in Virginia

Operational Alternative G

Ophthalmology residency programs plus
School of optometry in Virginia plus
Technical education program for vision
aides

Operational Alternative H

Ophthalmology residency programs plus
Technical education program for vision
care aides

The report on optometry manpower recommended that the study of the feasibility of establishing a school of optometry in Virginia (Senate Joint Resolution No. 1 of the 1974 Session of the General Assembly had been accepted prior to the conclusion of the Optometry Manpower Study) focus on the eight operational alternatives and develop empirical evidence that would permit an objective evaluation of these alternatives.

Legislation

Senate Joint Resolution No. 1 which was advanced by the Virginia Optometric Association, supported by the practicing optometrists in Virginia, and presented by Senator Paul W. Manns, was presented on January 1, 1974, and was approved by the Senate on February 19, 1974, and by the House of Delegates on February 28, 1974.

AMENDMENT IN THE NATURE OF A SUBSTITUTE FOR SENATE JOINT RESOLUTION NO. 1 (Proposed by the Senate Committee on Finance)

Directing the State Council of Higher Education to consider and report on the need for establishment of a school of optometry in the Commonwealth; and to appropriate funds.

Whereas, the Commonwealth of Virginia has a continuing and growing need for the delivery of optometric services; and

Whereas, there is a shortage of doctors of optometry in the Commonwealth and in some areas a total lack of optometric services; and

Whereas, the primary source of optometric services for the Commonwealth is its young people who enter the profession; and

Whereas, there is no school of optometry in Virginia and the Commonwealth does not offer training in this important field to our youth through its contractual relationship with the Southern Regional Education Board, and if it did, still only a limited number of students of this State would be accepted in certain optometric schools of other southern states each year; and

Whereas, a much larger number of qualified young people apply each year for spaces in these schools and cannot be accommodated; now, therefore, be it

Resolved by the Senate, the House of Delegates concurring, that the State Council of Higher Education is hereby directed to consider the need for establishment of a school of optometry in the Commonwealth and report upon the following:

(1) The existing and projected future needs for optometric services in the Commonwealth and the possible means of meeting such needs;

(2) Whether such needs reasonably justify the establishment of a school of optometry in the Commonwealth, and if so,

(3) The most practical and feasible method of establishing such a school and location for its establishment, and the approximate cost involved in its establishment and operation.

(4) The study shall also include consideration of visual health care educational programs other than optometry and report on their existing and future needs in the Commonwealth.

All agencies, officers and employees of the Commonwealth and all of its political subdivisions shall cooperate with and assist the Council of Higher Education in its work as required.

For the purpose of this study, there is hereby appropriated from the contingent fund of the General Assembly the sum of five thousand dollars.

The Council shall complete its work and report to the Governor and General Assembly no later than October fifteen, nineteen hundred seventy-five.

Thus, the Council of Higher Education for Virginia was given the responsibility of undertaking a study to determine the feasibility of estab-

lishing a school of optometry.

Optometry School Study Committee

Following the completion of the Optometry Manpower Study, the Council Staff asked its Advisory Committee on Education for Health Professions and Occupations to recommend a procedure to be used in conducting the Optometry School Study. At their June 1974 meeting, members of the Committee on Education for Health Professions and Occupations suggested that the Council staff be advised in its study by a committee to be comprised of optometrists, optometric educators, and because of their important role in providing eye care services, practicing ophthalmologists and ophthalmologic educators.

Selection Process. At the suggestion of the Advisory Committee, the Council Staff, during July and August, contacted the Virginia Optometric Association, the Medical Society of Virginia, and the Virginia Society for Ophthalmology and Otolaryngology and asked each to submit a list of prospective committee members. Additionally, the Staff reviewed the membership of the Optometric Manpower Committee of the Council and the contributions of each member of that Committee.

Membership. The lists of prospective committee members were submitted to the Council for consideration. Before the final selection was made, the Council employed as a consultant Dr. Thomas Mou, Provost for Health Sciences of the State University of New York Central Administration.¹

Using a combination of the recommendations provided by Dr. Mou and the list of prospective members, the following Optometry School Study Committee was identified:

John A. DiBiaggio, D.D.S., Richmond, Chairman
William R. Baldwin, O.D., Ph.D., Boston, Massachusetts
John B. Caldwell, M.D., Richmond
Honorable Orby L. Cantrell, Pound
Harold L. Friedenber, O.D., Richmond
Margaret B. Inman, Alexandria
Howard B. Kahn, O.D., Virginia Beach
Roderick Macdonald, M.D., Richmond
Senator Paul W. Manns, Bowling Green
Michael J. Obremsky, O.D., Annandale
Harry B. Taylor, Jr., M.D., Norfolk
Luther W. White, III, Ph.D., Ashland
Lauren A. Woods, M.D., Ph.D., Richmond (ex-officio)

Operating Procedure and Calendar

After determining that each of the identified individuals was willing to serve on the Committee, the Council Staff began the collection of background data, developed a preliminary study design and calendar, and visited a series of institutions that educate optometrists and their auxiliaries.²

MANPOWER DISTRIBUTION AND RATIOS

The legislation that authorized this study indicated a growing "need" for the delivery of optometric services. There are, however, a number of ways in which the need for health manpower is defined. Looking at the total vision care requirements of a population is one. However, this is not a realistic method since many citizens who need vision care do not receive the care because of their income or other restraints. Another procedure for estimating health manpower need is to determine the requirements within a given geographic boundary. This is, in most instances, neither correct nor the optimal number needed based upon the assumption that the public purchases all their eye care services in the state or county in which they reside. An additional means is to determine the requirements and demand for vision care personnel given an estimated income of a population. For the purposes of this study, we chose to examine a series of existing provider-to-population ratios because these ratios provide both a realistic and efficient method for evaluating the current demand for optometric and ophthalmologic services in a variety of settings.

With these factors in mind, the following information regarding current manpower distribution and ratios for optometrists and ophthalmologists is presented.

Optometrists

About 18,622 optometrists located in the United States held licenses and were active in the professions as of 1972. The estimate is based upon state registrations as published in 1974.

Suggested Manpower to Population Ratios

Among the variety of ratios that can be used for determining need within any health manpower category is the ratio of available health personnel to the population. With the exception of the American Optometric Association ratio, which is a suggested ratio, Table 1 presents the current optometrist and ophthalmologist-to-population ratios as presented in the Council of Higher Education's 1974 Health Manpower Study: Optometry Manpower.

Current National Ratios

The ratio of active optometrists to population for the nation as a whole is approximately 9.1 optometrists per 100,000 persons. This means about one optometrist exists for each 11,000 citizens. The American Optometric Association suggests the optimal ratio is one optometrist for every 7,000 persons. As with most other suggested ratios, no documented evidence exists to support this ratio. The table presented provides a series of manpower-to-population ratios for optometrists and ophthalmologists. Since the group health plans have developed their manpower requirements on the basis of the membership demands, these ratios would seem to be more objective than, for example, the one used by the American Optometric Association. Further, it is observed that the British model, based on more than twenty-five years of experience with National Health Insurance, also reflects a ratio which differs significantly from both the group plans and the ratios suggested by the American Optometric Association. For the purpose of the determination of the feasibility of establishing a school of optometry in the Commonwealth of Virginia, the Optometry School Study Committee and the Council Staff accepted the current national average of 9.1 optometrists per 100,000 as the target ratio.

TABLE 1

OPTOMETRISTS/POPULATION RATIOS, AND
OPHTHALMOLOGISTS/POPULATION RATIOS

	OPTOMETRY	OPHTHALMOLOGY
Health Insurance Plan of New York ¹	1:18,800	1:33,333
Kaiser-Permanente (Portland) ¹	1:18,130	1:48,333
Kaiser-Permanente (Oakland) ¹	1:18,000	1:32,333
Kaiser-Permanente (Los Angeles) ¹	1:18,750	1:45,000
Puget Sound Health Cooperative ¹	1:13,600	1:47,000
Group Health of D.C. ¹	1:12,000	*
American Optometric Association ²	1:7,000	*
United Kingdom ³	1:10,500	1:53,600
AVERAGE OF THE ABOVE	1:14,600	1:43,300

- Sources:
1. National Commission on Accrediting. A Summary Report, National Study of Optometric Education. Washington, D.C., 1973, p. 26.
 2. American Optometric Association. Concept Development for an Information Retrieval System for Optometry and Related Manpower. Washington, D.C., unpublished and undated mimeo, p. 45.
 3. The Canadian Association of Optometrists. Vision Care Needs and Optometric Manpower Requirements in Western Canada. Ottawa, Canada. November 1973, p. 15.

* Not Available

Current Southern States Distribution and Ratios

None of the fourteen states served by the Southern Regional Education Board reached the national average of 9.1 optometrists per 100,000 in 1973. The southern states range from a high of 7.9 to a low of 4.3 per 100,000. The ratio of optometrists per 100,000 population for each of these states and their corresponding national rank is shown in Table 2.

Current Distribution in Virginia

During the past twenty-five years, the ratio of practicing optometrists per 100,000 population in Virginia has remained relatively constant. From Table 3, we find that during the period between 1950 and 1974, the number of practicing optometrists per 100,000 varied from 5.48 in 1950 to 6.3 in 1960. The population per practicing optometrists of 16,590 in 1974 indicates that Virginia, as a state, would be declared a critical shortage area by the federal government.³

Planning District. In Table 4, the State Department of Health has provided the 1973-74 distribution of optometrists by planning district. Based on the June 1, 1973, population, the table provides the ratio of persons per optometrist and the number of optometrists required for each planning district to meet at least the critical ratio of optometrists as defined by the United States Department of Health, Education, and Welfare. As illustrated in Figures 1 and 2, there were forty-five critical shortage counties and five critical shortage cities in 1973. Because of the mobility of today's population, these indicators of shortage by county may be misleading. It is recognized, however, that as with other categories of health care personnel, there is a maldistribution with a tendency for the professional to locate in the more densely populated regions of the State. As indicated by

TABLE 2

ACTIVE OPTOMETRISTS IN THE S.R.E.B. STATES - 1973

S.R.E.B. States	Optometrists/100,000	National Rank
Alabama	4.3	50
Arkansas	7.9	35
Florida	7.8	36
Georgia	5.5	46
Kentucky	6.6	39
Louisiana	5.8	45
Maryland	5.1	48
Mississippi	5.1	47
North Carolina	6.0	43
South Carolina	5.9	44
Tennessee	7.6	37
Texas	6.5	40
Virginia	6.1	42
West Virginia	7.3	38

National Average Ratio = 9.1 Optometrists/100,000 Population

Source: Dorn, Wesley N., Thomas W. Mau, and Henry B. Peters. A Proposed Regional Plan for the Expansion of Optometric Education in the South. Atlanta, Georgia: Southern Regional Education Board, 1974.

TABLE 3

HISTORICAL VIRGINIA RATIOS

Year	Population (000)	Practicing Optometrists	Population/ Practicing Optometrist	Practicing Optometrist/ 100,000 Population
1950	3,319	182	18,236	5.48
1960	3,967	250	15,868	6.30
1970	4,648	271	17,151	5.83
1972	4,764	268	17,776	5.63
1974	4,811	290	16,590	5.90

Sources: American Optometric Association. Optometric Manpower Profile for the State of Virginia. St. Louis, Missouri: AOA, 1974.

Virginia. Optometrists Population, Ratio of Persons Per Optometrist and Optometrists Needed for 1:15,000 Ratio by Planning Districts. Virginia: Department of Health, 1972.

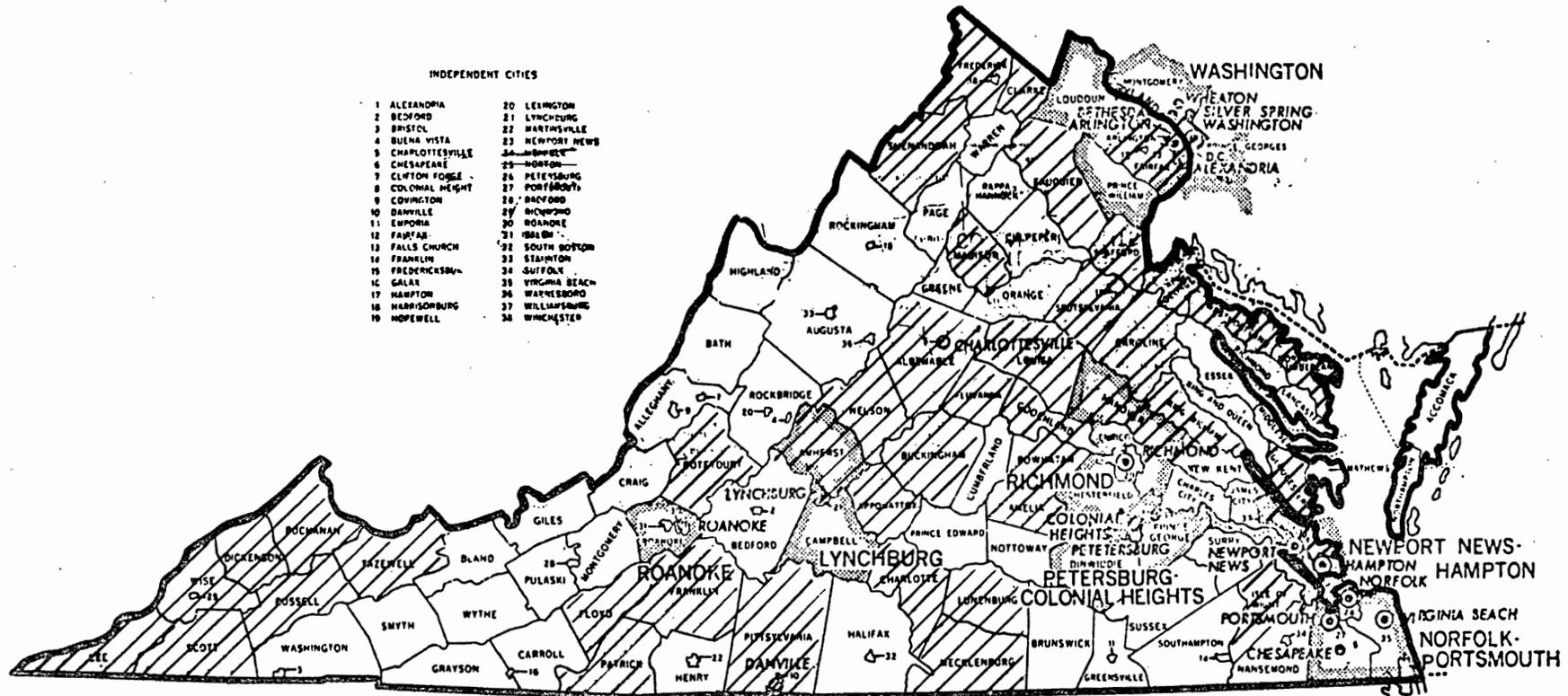
Total Counties = 96

Critical Shortage Counties = 45

Total Independent Cities = 38

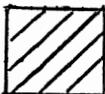
Critical Shortage Cities = 5

FIGURE 1



INDEPENDENT CITIES

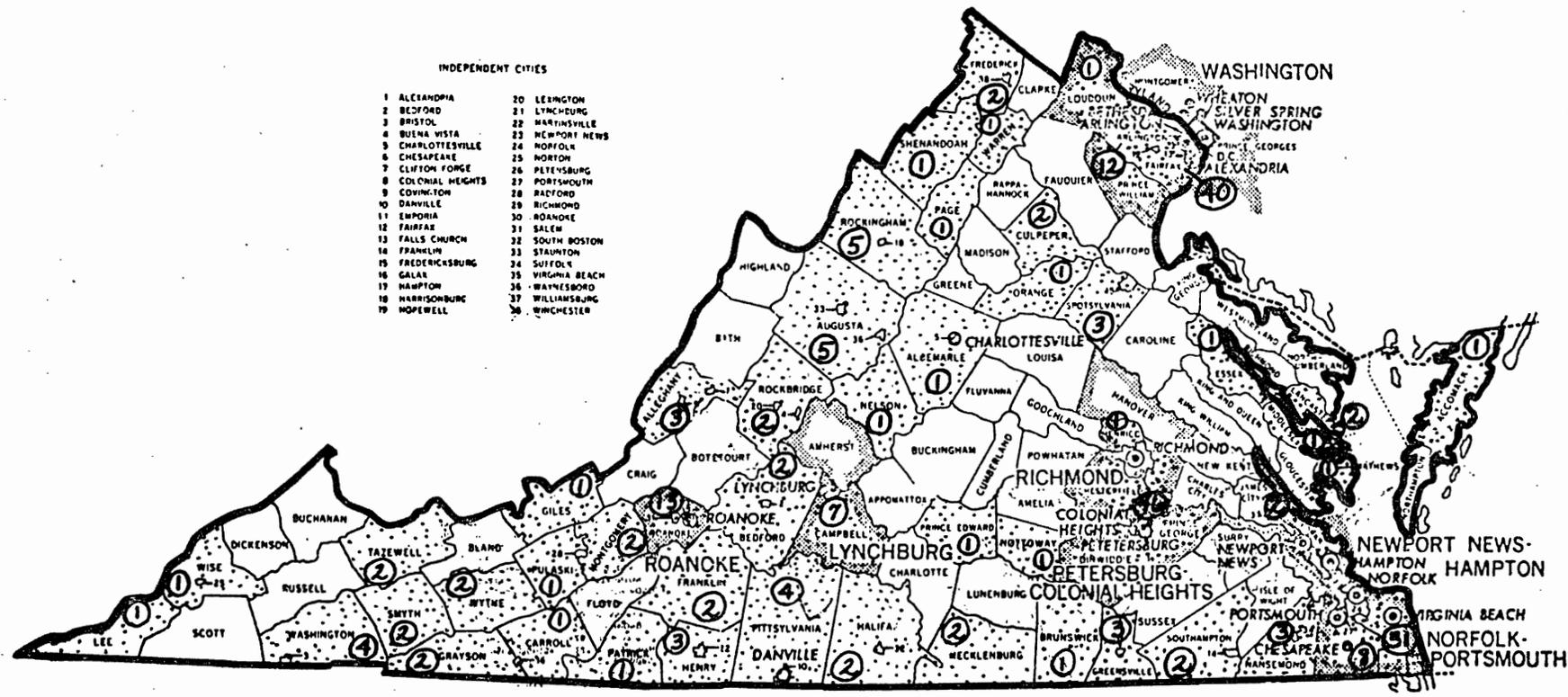
- | | |
|-------------------|-------------------|
| 1 ALEXANDRIA | 20 LEHNINGTON |
| 2 BEDFORD | 21 LYNCHBURG |
| 3 BRISTOL | 22 MARTINSVILLE |
| 4 BUENA VISTA | 23 NEWPORT NEWS |
| 5 CHARLOTTESVILLE | 24 ROANOKE |
| 6 CHESAPEAKE | 25 ROANOKE |
| 7 CLINTON FOSSE | 26 PETERSBURG |
| 8 COLONIAL HEIGHT | 27 PORTSMOUTH |
| 9 COVINGTON | 28 RAYFORD |
| 10 DANVILLE | 29 RICHMOND |
| 11 EMPORIA | 30 ROANOKE |
| 12 FAIRFAX | 31 RICHMOND |
| 13 FALLS CHURCH | 32 SOUTH BOTTOM |
| 14 FRANKLIN | 33 STANTON |
| 15 FREDERICKSBURG | 34 SUFFOLK |
| 16 GALAX | 35 VIRGINIA BEACH |
| 17 HAMPTON | 36 WAYNESBORO |
| 18 HARRISONBURG | 37 WILLIAMSBURG |
| 19 HOPWELL | 38 WINCHESTER |

 Counties classified as critical shortage areas by DHEW in 1968.

 Standard Metropolitan Statistical Areas (SMSA's)

Source: Dorn, Wesley N., Thomas W. Mou, and Henry B. Peters. A Proposed Regional Plan for the Expansion of Optometric Education in the South. Atlanta, Georgia: S.R.E.B., 1974.

FIGURE 2



INDEPENDENT CITIES

- | | |
|--------------------|-------------------|
| 1 ALEXANDRIA | 20 LEXINGTON |
| 2 BEDFORD | 21 LYNCHBURG |
| 3 BRISTOL | 22 MARTINSVILLE |
| 4 BUENA VISTA | 23 NEWPORT NEWS |
| 5 CHARLOTTESVILLE | 24 NORFOLK |
| 6 CHESAPEAKE | 25 NORFOLK |
| 7 CLIFTON FORGE | 26 PETERSBURG |
| 8 COLONIAL HEIGHTS | 27 PORTSMOUTH |
| 9 COVINGTON | 28 RAYFORD |
| 10 DANVILLE | 29 RICHMOND |
| 11 EMPORIA | 30 RICHMOND |
| 12 FAIRFAX | 31 SALEM |
| 13 FALLS CHURCH | 32 SOUTH BOSTON |
| 14 FRANKLIN | 33 STAUNTON |
| 15 FREDERICKSBURG | 34 SUFFOLK |
| 16 GALAX | 35 VIRGINIA BEACH |
| 17 HAMPTON | 36 WAYNESBORO |
| 18 HARRISONBURG | 37 WILLIAMSBURG |
| 19 HOPEWELL | 38 WINCHESTER |

OPTOMETRISTS-1973

N = 333

Active = 290

Ratio = 6.1/100,000

Total Counties and Independent Cities = 134

Total Counties and Independent Cities with O.D.'s = 72



Counties with Optometrists



Standard Metropolitan Statistical Areas (SMSA's)

Source: Dorn, Wesley N., Thomas W. Mou, and Henry B. Peters. A Proposed Regional Plan for the Expansion of Optometric Education in the South. Atlanta, Georgia: S.R.E.B., 1974.

Table 4, although sixteen of twenty-two planning districts would fall within the federal definition of critical shortage areas for the State as a whole, using 1973 statistics, only thirty-one optometrists would be required to remove Virginia from the list of critical shortage states.

Implication

Although the number of practicing optometrists in Virginia has gradually increased from 182 in 1950 to 290 in 1974, thirty-eight percent of the current practitioners were fifty years or older in 1972, and thus, many may not be practicing in 1980 (see Table 5).

A December 1974 Southern Regional Education Board report on a proposed regional plan for the expansion of optometric education in the South indicates when attrition, in-migration, and existing education trends are taken into consideration, Virginia will need twenty-nine new optometrists per year in order for Virginia to reach, by 1990, the 1975 national average of optometrists to population. It must be remembered that the simple addition of numbers of practitioners does not address the question of maldistribution.

Ophthalmologists

The ophthalmologist, a physician who specializes in diseases and refractive errors of the eye, is a major eye care provider and is therefore included in the response to that section of Senate Joint Resolution No. 1 which calls for the study to consider visual health care educational programs other than optometry and to report on their current and future needs in the Commonwealth. Both ophthalmologists and optometrists perform vision examinations and prescribe lenses; however, there exists a basic difference between the disciplines. Ophthalmology has special concerns for eye health in relation

TABLE 4

OPTOMETRISTS, POPULATION, RATIO OF PERSONS
PER OPTOMETRIST AND OPTOMETRISTS
NEEDED BY PLANNING DISTRICT

Planning District	Number of Optometrists (March 1974)	Population (June 1973)	Ratio of Persons per Optometrists	Optometrist Required for 1:15,000 Ratio
District 1	2	89,200	44,600	6
District 2	2	117,400	58,700	8
District 3	11	163,200	14,836	11
District 4	4	119,000	29,750	8
District 5	16	239,500	14,969	16
District 6	12	191,800	15,983	13
District 7	5	112,100	22,420	7
District 8	62	985,500	15,895	66
District 9	3	75,400	25,133	5
District 10	2	123,400	61,700	8
District 11	9	173,200	19,244	12
District 12	10	222,900	22,290	15
District 13	5	81,300	16,260	5
District 14	2	77,600	38,800	5
District 15	46	562,200	12,222	37
District 16	3	85,400	28,467	6
District 17	3	37,500	12,500	3
District 18	3	49,900	16,633	3
District 19	13	159,100	12,238	11
District 20	49	770,000	15,714	51
District 21	26	330,900	12,727	22
District 22	2	44,500	22,250	3
STATE TOTAL	290	4,811,000		321

TABLE 5

NUMBER AND PERCENT OF ACTIVE OPTOMETRISTS, 1972

Age in Years	Number	Percent
Under 30	33	11.4
30 - 39	50	17.2
40 - 49	97	33.4
50 - 59	84	29.0
60 - 69	16	5.5
70 and over	6	2.1
Not reported	4	1.4
TOTAL	290	100.0

Source: United States Department of Health, Education and Welfare. Public Health Service. Health Resources Administration. Licensed Optometrists in Virginia, 1972. Washington, D.C., 1973, p. 7.

to systemic disease, eye pathology, and ocular surgery. In addition to ophthalmologists, other physicians may treat eye disease.

Suggested Manpower to Population Ratios

An examination of Table 1 illustrates there are a number of ophthalmologist to population ratios with the observed range for group health plans being 1:32,333 to 1:48,333. To provide the services required in the British health system, there currently is one practicing ophthalmologist on the average for every 53,600 citizens.

Current National and Regional Ratios

In the United States, the average ratio of ophthalmologists to population in 1974 was 2.5 Board Certified ophthalmologists per 100,000. In that year, only two states in the S.R.E.B. region, Florida (2.6 per 100,000) and Maryland (2.5 per 100,000) equaled the national average.

Current Distribution in Virginia

The distribution of ophthalmologists and the ratio of ophthalmologists per population as well as the ophthalmologists required to achieve a 1:40,000 ratio (based on a June 1973 population estimate) are illustrated in Table 6.

TABLE 6

OPHTHALMOLOGISTS, POPULATION, RATIO OF PERSONS
PER OPHTHALMOLOGIST, AND OPHTHALMOLOGISTS
NEEDED BY PLANNING DISTRICT

Planning District	Number of Ophthalmologists (March 1974)	Population (June 1973)	Ratio of Persons per Ophthalmologist	Ophthalmologist Required for 1:40,000 Ratio
District 1	2	89,200	44,600	2
District 2	1	117,400	117,400	3
District 3	1	163,200	163,200	4
District 4	3	119,000	39,667	3
District 5	17	239,500	14,089	6
District 6	8	191,000	23,875	5
District 7	7	112,100	16,015	3
District 8	54 1/2	958,500	17,588	24
District 9	0	75,400		2
District 10	11	123,400	11,219	3
District 11	8	173,200	21,650	4
District 12	7	222,900	31,843	6
District 13	0	81,300		2
District 14	0	77,600		2
District 15	38 1/2	562,200	14,602	14
District 16	3	85,400	28,467	2
District 17	0	37,500		1
District 18	2 1/2	49,900	19,960	1
District 19	4	159,100	39,775	4
District 20	33	770,000	23,333	19
District 21	10 3/4	330,900	30,781	8
District 22	0	44,500		1
STATE TOTAL	211 1/4	4,811,000		120

Source: Virginia. Ophthalmologists Population, Ratio of Persons Per Ophthalmologist and Ophthalmologists Needed by Planning District. Virginia: State Department of Health, March 1974.

VISION CARE EDUCATION

The major vision care manpower categories include the optometrist, ophthalmologist, optometric technician, and ophthalmologic assistant. Optometry as a profession traces its concerns with human vision to the middle ages, although the name of optometry was adopted about seventy years ago. The optometrist specializes in detection and non-medical treatment of ocular abnormalities which reduce visual efficiency. The ophthalmologist is a Doctor of Medicine who specializes in diseases and refractive errors of the eye. Both the ophthalmologist and optometrist are aided by ancillary personnel for whom formal education programs have been developed in recent years.

Programs for Optometrists

Prior to 1900, the predecessors of the present-day optometrists received their education primarily through an apprenticeship. According to Robert Havighurst, there were more than sixty private schools training vision care manpower in 1900. One interesting phenomenon is that several of these early schools were called colleges of "optometry and ophthalmology" in their charter. In 1910, a course in optometry was instituted at Columbia University, and thus, optometric education began to move from its prior base in training schools. At first, the education was two years in length with the first year emphasizing basic trigonometry, physics, optics, anatomy, and physiology. The second year of the educational program consisted of physics, physiologic optics, optics, and theoretical optics.

By 1940, the duration of the optometry student's training had been extended to four years, by the 1950's it became five years, and in the 1960's it had been extended to six years. With the advent of the six-year program in universities, the awarded degree became the Doctor of Optometry (O.D.).

Current Education

Today, the four-year professional program of all twelve schools and colleges of optometry (Table 7) is preceded by a minimum of two years of education in an accredited institution, although a majority of first-year students have already completed a four-year collegiate program. In each institution, the program of study leads to a Doctor of Optometry degree.

Schools. Of the present twelve schools and colleges of optometry in the United States, seven are university affiliated while five are independent colleges (Table 8).

Enrollment. As shown in Table 8, the total enrollment in these institutions ranges from sixty-five at the State University of New York College of Optometry to 568 at the Southern College of Optometry in Memphis, Tennessee. The first-year student enrollment ranged from twenty-five at both the State University of New York College of Optometry and the School of Optometry at the University of Alabama in Birmingham to 150 students each at the Southern College of Optometry in Memphis, Tennessee, and the Illinois College of Optometry. Although both the State University of New York College of Optometry and the School of Optometry at the University of Alabama in Birmingham are relatively new institutions having admitted their initial classes respectively in 1971 and 1969, their current respective maximum class sizes of sixty and forty-five are well below the average of existing independent schools and colleges of optometry. The higher enrollment in the private institutions results from the fact that these schools must operate without the benefit of state support, and thus, they must depend substantially on the income generated by student tuition and fees. Table 9 shows the comparatively smaller enrollment in the public-supported institutions educating optometric manpower.

. As a result of the increased enrollment in private institutions the faculty-

TABLE 7

PRESENT SCHOOLS OF OPTOMETRY IN THE UNITED STATES

Name	Location	Founded
University of Alabama School of Optometry	Birmingham, Alabama	1969
Los Angeles College of Optometry	Los Angeles, California	1904
University of California School of Optometry	Berkeley, California	1923
Illinois College of Optometry	Chicago, Illinois	1955*
Indiana University Division of Optometry	Bloomington, Indiana	1951
Massachusetts College of Optometry	Boston, Massachusetts	1894**
State University of New York College of Optometry	New York, New York	1971
Ohio State University College of Optometry	Columbus, Ohio	1914
Pacific University College of Optometry	Forest Grove, Oregon	1921***
Pennsylvania College of Optometry	Philadelphia, Pennsylvania	1919
Southern College of Optometry	Memphis, Tennessee	1932
University of Houston College of Optometry	Houston, Texas	1952

Notes: * Formed by merger of Northern Illinois College of Optometry (founded 1872) and Chicago College of Optometry (formerly Monroe College of Optometry, founded 1937)

**Was the Klein School of Optics until 1909

***Originally the Northern Pacific College of Optometry. Affiliated with Pacific University in 1945

Source: Heath, Gordon G. *Optometric Manpower in Missouri*. (Missouri: Missouri Commission on Higher Education), June 1970, Table I.

TABLE 8

ENROLLMENT: SCHOOLS OF OPTOMETRY
1974-1975

State - Supported		Independent	
College	Number Enrolled	College	Number Enrolled
Indiana University	258	Illinois	516
Ohio State University	210	Massachusetts	282
Pacific University	280	Pennsylvania	513
State University of N.Y.	65	Southern California	280
University of Alabama	86	Southern	568
University of California	221		
University of Houston	263		
TOTAL	1383	TOTAL	2159
	State - Supported	1383	
	Independent	2159	
	GRAND TOTAL	3542	

Source: American Optometric Association. "Association of Schools and Colleges of Optometry Annual Enrollment Report, Academic Year 1973-74" Memorandum: Student Count, January 16, 1974.

TABLE 9

INSTRUCTIONAL EXPENDITURES PER STUDENT 1971-1972

School Number	Number of Students	Students Per FTE Faculty	Expenditure Per Student
Independent			
1	455	10.9	\$2,726
2	226	6.6	4,503
3	452	9.4	3,061
4	247	8.5	3,111
5	479	9.6	3,287
6	273	9.5	4,131
MEAN	355	9.1	\$3,920
Public Supported			
1	246	9.0	\$5,624
2	197	6.4	5,691
3	212	8.5	6,283
4	243	6.8	6,300
MEAN	225	7.7	\$5,975

Source: Havighurst, Robert J. Optometric Education: A Summary Report. (National Study of Optometric Education.) Washington, D.C.: National Commission on Accrediting, 1973, pp. 48-49.

student ratio is greater in these schools than in those that are state-supported. The 1973 study entitled "Optometric Education: A Summary Report" indicates a faculty-student ratio of 9.1 in the independent institutions while the publicly supported institutions have a ratio of 7.7 (Table 9). Conversations with Deans of schools of optometry indicate existing ratios in some private institutions are more than fourteen students per full-time equivalent faculty member. The 1973 Havighurst study indicates free-standing institutions require a substantially greater faculty-student ratio (11.7) than those institutions affiliated with a university where faculty-student ratios average 8.8.

Costs. Table 9 presents the instructional expenditures per student for the 1971-72 academic year. With their greater-than-average student enrollment, the 1973 expenditure per student in independent institutions was approximately \$2,000 less than that reported for publicly supported institutions.

Applicants. With optometry, as with other health professions, there has been an increasing number of applicants competing for places in entering classes. Although the 1974 ratio of applicants to actual enrollees for schools and colleges of optometry was approximately 3:1, there was a greater ratio of applications to available places (8:1) because many students hoped to increase their chances of acceptance by applying to several institutions. There is an increasing tendency for places in entering classes to be reserved for applicants who are residents of those states having publicly supported schools of optometry. An increasing proportion of those in the entering classes of private schools and colleges of optometry will be from states who contract for places for their residents (134 of the 150 students in the entering class at the Southern College of Optometry in Memphis, Tennessee, are in places contracted for by their home state).

Graduates. The graduates from schools of optometry between the aca-

demographic years 1941-42 and 1973-74 are presented in Table 10. Following the peak post-World War II years of 1948-1950, the total graduates from schools of optometry remained relatively constant (between 300 and 400 annually) from 1955 to 1965. With the introduction of incentives provided by federal funding, the number of graduates has increased continually since 1969.

Current Education for Virginians

Currently, Virginians compete with the national applicant pool for positions in one of the twelve existing schools of optometry, all of which are located outside the Commonwealth.

Applicants. Of the forty-two Virginians who completed the optometric college admission test during the 1973-74 academic year, eighteen or approximately forty-three percent were successful in gaining enrollment in a school or college of optometry. This compares favorably with the national picture where approximately one of every three applicants is enrolled. The eighteen successful Virginians were enrolled in six of the existing schools (School of Optometry at the University of Alabama in Birmingham-two, Illinois College of Optometry-one, Indiana University-two, Massachusetts College of Optometry-three, Pennsylvania College of Optometry-five, and the Southern College of Optometry in Memphis, Tennessee-five).

Enrollments. During the 1974-75 academic year, a total of fifty-five Virginians were enrolled in seven of the existing twelve schools (School of Optometry at the University of Alabama in Birmingham-seven, Illinois College of Optometry-seven, Indiana University-four, Southern California College of Optometry-two, Massachusetts College of Optometry-three, Pennsylvania College of Optometry-seventeen, and Southern College of Optometry in Memphis, Tennessee-fifteen) (Table II).

TABLE 10

GRADUATES OF OPTOMETRY SCHOOLS IN THE UNITED STATES

Academic Year	Graduates	Academic Year	Graduates
1941-42	418	1958-59	323
1942-43	336	1959-60	375
1943-44	326	1960-61	319
1944-45	157	1961-62	334
1945-46	216	1962-63	350
1946-47	528	1963-64	384
1947-48	1,452	1964-65	377
1948-49	1,934	1965-66	413
1949-50	1,572	1966-67	481
1950-51	961	1967-68	477
1951-52	636	1968-69	439
1952-53	684	1969-70	445
1953-54	674	1970-71	530
1954-55	473	1971-72	687
1955-56	333	1972-73	716
1956-57	355	1973-74	797
1957-58	349		

Source: Michigan. "Vision and Eye Care Services in Michigan". Lansing, Michigan: Office of Health and Medical Affairs, April 1974.

TABLE 11

VIRGINIANS ENROLLED IN SCHOOLS OF OPTOMETRY
1974-1975

School	Number Enrolled
University of Alabama	7
University of California	0
University of Houston	0
Illinois College of Optometry	7
Indiana University	4
Southern California College of Optometry	2
Massachusetts College of Optometry	3
Ohio State University	0
Pennsylvania College of Optometry	17
Pacific College of Optometry	0
Southern College of Optometry	15
State University of New York College of Optometry	0
TOTAL	55

Source: "Student Enrollment From Southern Council of Optometrists States 1974-75",
College Liaison. Atlanta, Georgia: Southern Council of Optometrists, 1974.

1. **Contracts.** Through a mechanism established by the Southern Regional Education Board, states without schools of optometry contract for student places in one of the three optometry schools located in the Southeast. A contract in this instance refers to an agreement whereby a state without a school of optometry agrees to pay an existing school of optometry a set fee for a student place which the school agrees to reserve for residents of the contracting state. All applicants to the school of optometry from the contracting state compete for the contract-supported positions and the successful applicants must meet the educational standards of the institution.

The State of Virginia currently contracts for five student places, with three at the Southern College of Optometry and two at the School of Optometry at the University of Alabama in Birmingham. The educational opportunities afforded residents of Virginia through contracted places were first available to those applying for the entering class in the fall of 1974. Under the current agreement, which is scheduled to be reviewed in 1976, the Southern College of Optometry and the School of Optometry at the University of Alabama in Birmingham receive \$2,000 per student per year.

2. **Non-Contract.** Since only five residents in Virginia received their entering places through contracts, the remaining fifty Virginians enrolled in existing schools of optometry gained their opportunities in their respective institutions by competing in the national applicant pool.

Costs. Contract students from Virginia at the School of Optometry at the University of Alabama in Birmingham pay the in-state tuition and fees as indicated in Table 12, while those enrolled at the Southern College of Optometry in Memphis, Tennessee, benefit by paying the lower contract tuition rate (tuition per contract student - \$3,246, per non-contract student - \$5,246).

Graduates. Combining the information presented in Table 13 with the

TABLE 12

TUITION FEES FOR 1974 - 1975

Independent		State Supported		In-State	Out-of-State
Southern	\$4,549	New York		\$1,600	\$2,000
Massachusetts	2,530	Indiana		900	2,015
Pennsylvania	2,957	Alabama		900	1,800
Los Angeles	2,800	Ohio		930	1,980
Illinois	2,570	California		637	2,139
Pacific	2,090	Houston		286	1,510
MEAN	\$2,916	MEAN		\$ 875	\$1,907
RANGE	\$2,090-4,549	RANGE		\$ 286-1,600	\$1,510-2,137

Source: Information for Applicants to Colleges of Optometry, Fall 1975. Association of Schools and Colleges of Optometry, Inc. Fall 1974, p. 5.

TABLE 13

VIRGINIA RESIDENTS IN OPTOMETRY SCHOOLS IN 1975
BY YEAR OF SCHEDULED GRADUATION
1974-1975

Year of Graduation	Projected Graduates
1975	13
1976	10
1977	12
1978	19
TOTAL	54

Note: It is recognized that the total number of Virginians enrolled in schools of optometry as indicated in this table, differs from the figure shown in the table "Virginians Enrolled in Schools of Optometry." In conversations with American Optometric Association personnel, the differences were suggested to be persons involved in graduate education.

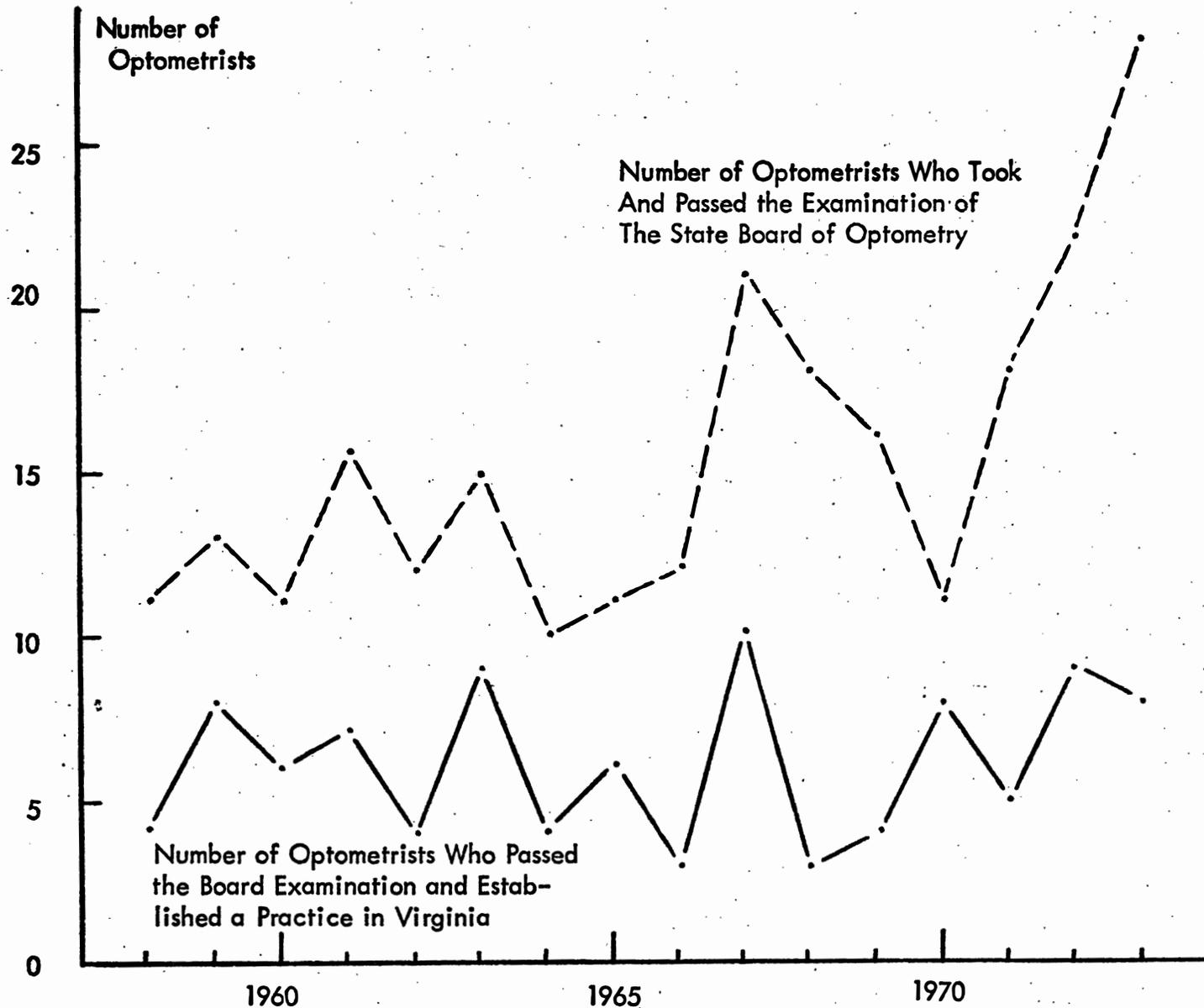
Source: American Optometric Association. "Geographical Origin and Years of Graduation". Memorandum: Student Count, January 16, 1975.

fact that the attrition rate at schools training health professionals is generally less than ten percent, we can predict that an average of ten Virginians will graduate from schools of optometry during each year between 1975 and 1978. Figure 3 provides the results of examinations administered by the State Board of Optometry and indicates the number of optometrists who, for each year between 1958 and 1974, passed the Board Examinations and established a practice in Virginia.

Future Education

At present, optometry schools are in various stages of planning in Florida, Michigan, and Missouri. If the legislatures approve funding of institutions in those states, it can be reasoned from the guidelines of the Association of Schools and Colleges of Optometry (Appendix A) that opportunities will exist for the placement of approximately 180 additional optometry students annually. Within the fourteen states served by the Southern Regional Education Board, optometry schools are being considered by Georgia, Kentucky, Maryland, Mississippi, North Carolina, and South Carolina in addition to Virginia.

Existing Schools. Of the twelve schools of optometry existing in 1975, only Alabama, Houston, and the State University of New York College of Optometry are anticipated to increase their enrollment. Partially off-setting the increased enrollment potential of Alabama and Houston is the fact that the Board of Directors of the Southern College of Optometry in Memphis have reduced the enrollment level for the 1975 entering class from 150 to 135 and project a gradual reduction in the size of their entering class until 1980, when 100 students will be admitted annually. Taking into consideration the likely enrollment of the twelve existing schools of optometry and the three in various stages of planning, it can be anticipated that approximately 1,000



RESULTS OF EXAMINATIONS OF STATE BOARD OF OPTOMETRY AND THE NUMBER ESTABLISHING A PRACTICE IN VIRGINIA, 1958-1973

FIGURE 3

to 1,100 places will be available annually in colleges of optometry by 1980.

Future Education for Virginians

In keeping with a trend which is occurring in other publicly supported professional schools, it can be anticipated that an increasing proportion of the student places in publicly supported optometry schools will be reserved for residents from the state within which the institution is located. Another rapidly developing trend is that private schools of optometry are reserving an increasing proportion of their entering places for students whose home state agrees to pay capitation fees.

Opportunities for Enrollment. Opportunities for Virginians in out-of-state institutions can only be ensured to the extent that student places are secured for qualified applicants through a contract procedure. As revealed by Table 14, most independent schools and colleges of optometry have indicated to the American Optometric Foundation their willingness to expand their contract activities.

In cooperation with the American Optometric Foundation and the Association of Schools and Colleges of Optometry, the American Optometric Foundation has developed what it calls a contract sponsorship program. Under this program:

1. The American Optometric Foundation will provide background information, cost figures, available entering spaces, and other pertinent information to states as they go through the process of securing either legislative support or support of the designated state agency responsible for administering state-aid programs.

2. Once funds are secured, the American Optometric Foundation will

TABLE 14

OPTOMETRY SCHOOL CONTRACT POSITIONS
NOT CURRENTLY ASSIGNED TO SPECIFIC STATES

School	Positions	Fee/Positions
Alabama	S.R.E.B. ¹	
Houston	10 ²	\$4,000
Illinois	20+	4,000
Indiana	none	
Massachusetts	X	4,000
New York	none	
Ohio	extremely limited	5,000
Pacific	a few	4,000
Pennsylvania	20	4,000
Southern	S.R.E.B. ³	
Southern California	20+	4,000
University of California	none	
University of Missouri	5-10 ⁴	4,000

Notes: 1. Virginia contracts with Alabama for two positions per year. Possible negotiation for additional positions.

2. Some S.R.E.B. positions available.

3. Virginia contracts with Southern for three positions per year. No expansion possible.

4. Dr. Larrie J. Dean's conversation with Dr. Frederick C. Brechler of the University of Missouri on January 31, 1975.

Source: American Optometric Foundation. Washington, D.C., March 1975.

work with the appropriate state officials to contract spaces for which the state has secured funds.

3. The American Optometric Foundation will then contract with the schools participating in the program to secure the spaces funded by the state.

4. The American Optometric Foundation indicates its willingness to handle necessary administrative details for the states, such as verification of student enrollment at the schools and other necessary details for each school year.

The American Optometric Foundation recommends the minimum value of \$4,000 per student per year for each of the contract places it administers.

As previously mentioned, the Southern Regional Education Board also operates a contract mechanism. In 1973, there were 129 contract places supported by S.R.E.B. states not having their own optometry schools. These places were distributed among Southern College of Optometry-106; School of Optometry at the University of Alabama in Birmingham-10; and the University of Houston-13.

Based upon verbal communication between the Staff of the State Council of Higher Education for Virginia and the Deans and Presidents of several existing schools of optometry, the most likely contract opportunities for Virginians are with the independent schools in Pennsylvania, Massachusetts, Tennessee, Illinois, and California and with the developing school of optometry in Missouri. During a visit to the Pennsylvania College of Optometry on April 14, 1975, the Staff of the Council of Higher Education commenced a series of discussions with officials of the Pennsylvania College of Optometry with the purpose of exploring the possibility of securing contract spaces for Virginians at the Pennsylvania College of Optometry. A letter from the

Virginia Optometric Association dated April 21, 1975, and correspondence from Dr. Norman E. Wallis, President of the Pennsylvania College of Optometry dated May 2, 1975, indicate the support of the Virginia Optometric Association for contractual seats for ten entering students.

State Cost. Contracts which the Pennsylvania College of Optometry has signed with the University of Maryland and the University of North Carolina for the entering class of 1975 are at the capitation figure of \$4,000 per student per year. Based on the communication from Dr. Wallis and the recommendation of the American Optometric Foundation, Virginia can expect to pay approximately \$4,000 per student per year for each contract space secured for Virginians.

Student Cost. Virginians enrolling at institutions where the Commonwealth has secured contract spaces can anticipate paying the then current in-state tuition and fees or, in the case of the independent institutions, the contract student's fee (anticipated to be the actual first student portion of the operating budget of the institution less the capitation fee paid by the sponsoring state).

Programs for Ophthalmologists

An ophthalmologist is a Doctor of Medicine. In theory, therefore, any student training to become a physician could, with the availability of appropriate residency opportunities, become an ophthalmologist.

Current Education

The basic education of the ophthalmologist includes four years of undergraduate education, four years of medical school plus an additional three

or four years of internship and residency.

Residencies. In the past two decades, the number of ophthalmology residencies available nationwide has increased in excess of 150 percent (see Table 15). Of the 1,496 residencies offered in 1972, 1,472 or 98 percent were filled.

Costs. According to information reported in the 1973-74 Directory of Approved Internships and Residencies, the beginning average salary for residents nationwide was \$10,818. This amount included only money paid to the resident and did not include the cash equivalent of fringe benefits such as living quarters or living allowances, food or food allowances, or other non-salary items. This average is for all medical specialties in all sections of the nation.

Current Education for Virginians

Table 16 reports the number of first-year residency positions available in Virginia at the Medical College of Virginia, the University of Virginia, and the Veterans Administration Hospital in Richmond. Table 16 also indicates the number of ophthalmology residents projected to be in training in Virginia from 1973-74 to 1979-80.

Costs. The ophthalmologic educators on the Optometry School Study Committee estimate the average salary paid an ophthalmologic resident in Virginia in 1975 to be \$14,000.

Future Education

Information presented in the 1973-74 Directory of Approved Internships and Residencies reveals that the American Medical Association Residency

TABLE 15

OPHTHALMOLOGY RESIDENCIES: NATIONWIDE

	1950	1960	1970	1972	Growth	
					1950- 1970	1960- 1970
Approved Program	172	179	160	164	-7%	-11%
Total Residencies Offered	551	837	1385	1496	151%	65%
Total Residencies Filled	437	807	1360	1472	211%	69%
Percent Filled	79%	96%	98%	98%	24%	2%

Source: U.S. Congress. Senate. Health Professions Educational Assistance Act of 1974. Senate Report No. 1133 to accompany Senate Report No. 3585, 93rd Congress, 2nd Session, 1974, p. 79.

TABLE 16

PRESENT AND PROJECTED
OPHTHALMOLOGY RESIDENCIES IN VIRGINIA

	1973- 1974	1974- 1975	1975- 1976	1976- 1977	1977- 1978	1978- 1979	1979- 1980
Medical College of Va. ¹	3	4	4	4	4	4	4
TOTAL	9	10	11	12	12	12	12
University of Virginia ²	2	2	2	2	2	2	2
TOTAL	6	6	6	6	6	6	6
Veterans Administration ³ (Richmond)	1	1	1	1	1	1	1
TOTAL	3	3	3	3	3	3	3
TOTAL PER ANNUM	6	7	7	7	7	7	7
TOTAL RESIDENCIES	18	19	20	21	21	21	21

- Sources: 1. Medical College of Virginia of the Virginia Commonwealth University. Department of Ophthalmology. Richmond, Virginia, 1975.
2. The University of Virginia Medical Center. Department of Ophthalmology. Charlottesville, Virginia, 1975.
3. Veterans Administration Hospital. Department of Ophthalmology. Richmond, Virginia, 1975.

Review Committee for Ophthalmology, between July 1, 1972, and June 30, 1973, approved seven new residency programs while withdrawing approval from one existing program. Information submitted by the American Association of Ophthalmology and Otolaryngology indicates a similar number of programs were approved in 1974. The future expansion of ophthalmologic and other medical specialty residency programs is in doubt given indications of congressional desire to regulate residency programs in hopes of solving specialty and geographic maldistribution.

Future Education for Virginians

Table 16 indicates the total number of ophthalmology residents projected to be in training in Virginia during each of the years between 1973-74 and 1979-80.

Programs for Auxiliaries

Both the optometrist and the ophthalmologist are frequently assisted in their practice by auxiliaries.

Optometric Auxiliaries

Optometric auxiliaries may be divided into four groups: 1) optometric technicians, 2) optometric assistants, 3) office assistants, and 4) opticians. Optometric technicians are specifically trained to assist the optometrist in his professional service functions and augment his capabilities for providing such service. The optometric assistant is usually trained on the job, although in a few instances, the assistant is educated formally in a one-year program. The office assistant performs such non-technical duties as office management, appointment keeping, and bookkeeping. The optician performs specific

technical services including servicing and preparing lenses, frames, contact lenses, and special optical aides upon prescription. The optician's education varies, with many students receiving their training through an apprenticeship while others attend a formal education program in a community college.

Current Programs. Table 17 indicates that six of the nation's twelve schools of optometry provide education for optometric auxiliary personnel. The supply of optometric services can be increased either by increasing the number of optometrists or by increasing the number of optometric auxiliary personnel. By delegating all skills requiring lesser levels of education and training to their auxiliaries, the optometrists can perform the higher-level tasks for which they have been educated.

Manpower Utilization. In 1972, the American Optometric Association conducted a survey of Virginia optometrists. Of the 290 optometrists who responded, 231 employed supplementary personnel. Table 18 displays by job title and education the personnel employed by Virginia's optometrists in 1972. The formally trained optometric technician is increasingly gaining acceptance in both group and established solo practices.

Ophthalmic Medical Assistants

The ophthalmic medical assistants are divided into three major groups: 1) ophthalmic assistants, 2) ophthalmic technicians, and 3) ophthalmic technologists. Literature provided by the Joint Commission on Allied Health Personnel in Ophthalmology indicates the ophthalmic medical assistant plays a directly supporting role to the physician, but does not play a role as a regulated or limited independent practitioner. No decisions requiring clinical judgment or interpretation are expected of the assistant, and the education and training of the assistant does not prepare him for such decisions.

TABLE 17

EDUCATIONAL PROGRAMS, NATIONALLY,
FOR OPTOMETRIC AUXILIARY PERSONNEL

College	Number Of Students
Colleges of Optometry*	
University of Alabama	9
Indiana University	58
Southern California School of Optometry	20
Massachusetts College of Optometry	31
State University of N.Y. College of Optometry	31
Southern College of Optometry	7
TOTAL	156
Non-Colleges of Optometry**	
Los Angeles City College	2
Merritt College, Oakland	
Miami-Dade Junior College	16
Colby Junior College of Women, New London, N.H.	
Lakeshore Technical Institute - Sheboygan, Sheboygan Falls, Wisconsin	14
TOTAL	33

*Source: American Optometric Association. Memorandum dated January 16, 1974.

**Source: United States Department of Health, Education, and Welfare. Health Resources Statistics, 1972 - 1973. Washington, D.C., June 1973, p. 250.

TABLE 18

SUPPLEMENTARY PERSONNEL EMPLOYED
BY OPTOMETRISTS IN VIRGINIA, 1972

Supplementary Personnel	Number of	
	Full-time Employees	Part-time Employees
Secretary/Receptionist	244	
Optometric Auxiliary Personnel		
Graduate, one-year program	5	
Graduate, two-year program	2	
Received formal training, program not completed	3	
Office trained only	95	5
Dispensing Optician	3	32
Optical Technician (shopman)	4	101
Contact Lens Technician		31
Other	10	4
TOTAL	366	173

Source: Division of Manpower Intelligence, Bureau of Health Resources Development, Health Resources Administration, United States Department of Health, Education, and Welfare. Washington, D.C., 1974. Unpublished Information.

Current Programs. Joint Commission accredited ophthalmic assistant programs in the fourteen state area served by the Southern Regional Education Board includes those at Baylor University College of Medicine, the Houston Eye Foundation, and Georgetown University. Among accredited ophthalmic technician programs are those at the University of Florida (Gainesville), Emory University and Georgetown University.

DEVELOPMENT OF AN OPTOMETRY SCHOOL

Until recently, no formal set of guidelines existed for the creation of a new school of optometry. The Committee on New Academic Facilities of the American Optometric Association has developed some estimates of operating costs, staffing requirements, curriculum development, and required facilities. The existing schools and colleges of optometry exhibit great diversity in their administrative organization, operating procedures, and physical facilities.

Location Requirements

In September 1974, the Board of Directors of the Association of Schools and Colleges of Optometry (A.S.C.O.) adopted a statement on new schools and colleges of optometry (Appendix A) which set forth a series of location factors. Of major importance is that the school be located in an urban area where the out-patient and satellite clinics of the college can draw upon a large population of patients for training the students. The A.S.C.O. statement recommends that schools be located in communities of at least 200,000 population.⁴

The authors of the A.S.C.O. statement, as well as optometric educators, generally feel the most advantageous location for a new school or college of optometry is in an academic health center. Of the twelve existing schools and colleges of optometry, only the School of Optometry at the University of Alabama in Birmingham is organizationally within an academic health center. The location of the school within a university containing an academic health center provides a base for development of graduate programs. The S.R.E.B. Proposed Regional Plan for the Expansion of Optometric Education in the South contains a table, included in this report as Table 19, which

POTENTIAL LOCATIONS FOR NEW SCHOOLS OF OPTOMETRY

**Academic Health Science Centers Located in
Urban Areas of 200,000 or More**

State	Academic Health Science Center	Location
Alabama	University of South Alabama	Mobile
Arkansas	University of Arkansas	Little Rock
Florida	University of Miami University of South Florida	Miami Tampa
Georgia	University of Georgia Emory University	Augusta Atlanta
Kentucky	University of Louisville University of Kentucky	Louisville Lexington
Louisiana	Tulane University Louisiana State University	New Orleans New Orleans
Maryland	John Hopkins University University of Maryland	Baltimore Baltimore
Mississippi	University of Mississippi	Jackson
North Carolina	Bowman Gray - Wake Forest College Duke University	Winston-Salem Durham
South Carolina	University of South Carolina	Charleston
Virginia	Virginia Commonwealth University Old Dominion University/Eastern Virginia Medical School	Richmond Norfolk
Tennessee	Meharry Medical School Vanderbilt University University of Tennessee	Nashville Nashville Memphis
Texas	University of Texas University of Texas	Dallas San Antonio

Source: Dorn, Wesley N., Thomas W. Mou, and Henry B. Peters. A Proposed

lists potential locations for new schools of optometry. Each of the twenty-one locations presented meets the criteria presented in this section of our report.

Construction Cost

The development of a new school or college of optometry includes the planning and construction costs of specialized laboratories, clinics, classrooms, and offices as well as research and support space. Table 20 presents the costs for constructing and equipping five schools of optometry built or expanded between 1969 and 1975. The substantial variation in these costs can be explained by a series of variables including the size of the entering class, the extent to which the school depends upon facilities and equipment of an existing university, the extent to which previously existing facilities continue to be utilized, and the extent of federal construction money available. The authors of the S.R.E.B. proposed regional plan for optometric education estimate the costs of construction and equipping a school designed for 240 students which includes sixty students entering annually would be approximately \$10,000,000.

The basic facility requirements for schools without graduate programs are presented in Table 21. These have been determined by using guidelines presented in the Manual of Accrediting of the Council of Optometric Education of the American Optometric Association.

Operating Budget

The authors of the S.R.E.B. report estimate the cost of operating an optometry program to be approximately \$8,000 per student per year based upon 1974 dollars. In making this estimate, it was assumed that the school would be located in an academic health center where the school would have access to basic health science programs and that newly established institutions would have reached their target enrollment. The per-student cost in years prior to

TABLE 20

CONSTRUCTION COSTS: SCHOOL OF OPTOMETRY

Schools	Year Construction Completed	Total Construction Costs and Equipment	Entering Class Size 1974	Enrollment 1974
Alabama	1975	\$4.7 million	25	200
Houston	1975	\$9.9 million	66	276
Illinois	1969	\$6.6 million	75	300
Southern California	1973	\$2.4 million	91	182
Waterloo	1974	\$4.7 million	60	250

Source: Author's compilation. Data provided by the institutions.

when the school reaches its target enrollment would exceed the \$8,000 estimate. Locating the school in an area where access to existing basic science programs is unavailable would also increase the cost per student. Combining the cost estimate per student with the Association of Schools and Colleges of Optometry's suggested sixty student per class enrollment, the approximate operating budget would be \$1,920,000 per year.

Funding

The current authority for federal support for new and existing schools and colleges of optometry is the Comprehensive Health Manpower Training Act of 1971. There are a variety of components of that legislation through which funds are provided for optometric education. They include:

1. Construction Grants
 - a. Major expansion
 - b. Minor expansion
2. Basic Improvement and Capitation Grant
3. Scholarship Grants
4. Special Project Grants
5. Student Loan Revolving Fund

At the present time, June 1975, the future of federal support for health manpower education including optometry is in question. Existing programs are operating under continuing resolutions while Congress considers new health manpower legislation. In an effort to correct geographic maldistribution, influential congressmen are proposing eliminating capitation and other institutional support monies and providing direct student assistance. The direct student support programs would be coupled with requirements for service in identified critical shortage areas.

TABLE 21

BUILDING REQUIREMENTS: SCHOOLS WITHOUT GRADUATE PROGRAMS

	For Schools Enrolling	
	200	240
1. Clinic	12,000 sq. ft.	14,400 sq. ft.
2. Classrooms	2,400 sq. ft.	2,880 sq. ft.
3. Administration	3,000 sq. ft.	3,600 sq. ft.
4. Instructional media	1,500 sq. ft.	1,800 sq. ft.
5. Machine shops	1,000 sq. ft.	1,200 sq. ft.
6. Faculty offices	3,770 sq. ft.	4,550 sq. ft.
7. Research	1,800 sq. ft.	2,160 sq. ft.
8. Labs	8,000 sq. ft.	9,600 sq. ft.
9. Student-Faculty commons	1,400 sq. ft.	1,680 sq. ft.
10. Student lockers	1,000 sq. ft.	1,200 sq. ft.
13. Library	3,000 sq. ft.	3,600 sq. ft.
SUB-TOTAL	38,870 sq. ft.	46,670 sq. ft.
14. Storage; 10% of sub-total	3,887 sq. ft.	4,667 sq. ft.
TOTAL	42,757 sq. ft.	51,337 sq. ft.

Source: American Optometric Association. Manual of Accrediting of the Council on Optometric Education and the American Optometric Association. St. Louis, Missouri: American Optometric Association, 1971.

Note: Items 11 and 12 have not been included as they concern the building requirements of schools with graduate programs.

REGIONAL COOPERATION

Opportunities exist for those southeastern states which are currently considering schools of optometry to cooperatively develop institutions designed to meet their collective needs. Unilateral action on the part of each state to develop an in-state school would produce more optometrists than required to achieve the current national average.

The American Optometric Association, Association of Schools and Colleges of Optometry, state optometric associations, and major optometric education consultants have supported the concept that optometry schools should be developed to meet regional rather than single state manpower needs.

The Southern Regional Education Board, in its proposed regional plan for the expansion of regional optometric education in the South, proposes the development of two or three schools of optometry with a capacity for sixty entering students. If Alabama and Houston both increase their enrollment to planning capacity, Florida initiates its authorized school and the Southern College of Optometry continues its present enrollment policy, then authors Dom, Mou, and Peters recommend the establishment of colleges in each of two areas as follows: 1) Maryland, Virginia, West Virginia, and 2) North Carolina, South Carolina, Georgia.

However, if the Southern College of Optometry reduces the size of its entering class by fifty percent (authorized by the trustees of Southern College to take place by 1980), Alabama and Houston increase their enrollment to planning capacity, and Florida initiates its authorized school, the same authors recommend the establishment of a school in each of the three following areas: 1) Maryland, Virginia, West Virginia, 2) North Carolina, South Carolina, Georgia, and 3) Arkansas, Louisiana, Mississippi.

The State Council of Higher Education for Virginia has received letters supporting exploration of a possible regional school of optometry from

the optometric associations in Maryland, Virginia, and West Virginia. The Executive Director of the Maryland Council for Higher Education and the Chancellor of the West Virginia Board of Regents have both indicated a willingness to participate in an examination of the possibility of establishing a school or college of optometry to serve their states as well as Virginia. Similar sentiments have been expressed by the North Carolina Board of Higher Education and the North Carolina Optometric Association.

Based upon the projected annual need for optometrists per state between now and 1990, Maryland, North Carolina, Virginia, and West Virginia collectively appear to have a need for additional optometrists which is sufficient to warrant the establishment of a regional school of optometry. The need for optometrists in each of these and other states in the fourteen state S.R.E.B. area are presented in Table 22.

SUMMARY

TABLE 22

ADDITIONAL NUMBER OF OPTOMETRY STUDENT PLACES REQUIRED
PER YEAR 1973-1990 TO ACHIEVE NATIONAL AVERAGE BY 1990*

	Total Number of Student Places Needed Per Year 1973-1990
Alabama	21
Arkansas	10
Florida	41
Georgia	29
Kentucky	17
Louisiana	23
Maryland	28
Mississippi	13
North Carolina	29
South Carolina	15
Tennessee	21
Texas	71
Virginia	29
West Virginia	8
TOTAL	355

Note: *Consider: death, disability and retirement of present active optometrists, changes in population, attrition of students. National average = 9.1/100,000.

Source: Dorn, Wesley N., Thomas W. Mou, and Henry B. Peters. A Proposed Regional Plan for the Expansion of Optometric Education in the South. Atlanta, Georgia: S.R.E.B., 1974.

SUMMARY

Information contained in the previous sections reveals that numerous optometrist- and ophthalmologist-to-population ratio models exist. The American Optometric Association has determined the optimal optometrist-to-population ratio be 1:7,000, while the United States Department of Health, Education, and Welfare, in 1968, determined the critical shortage areas to be those having a ratio of less than one optometrist per 15,000 residents. The data presented in this study indicates Virginia, as of 1973, had a ratio of 5.9 optometrists per 100,000 (1:16.6) compared to the national average of 9.1 active optometrists per 100,000 population. Both Virginia and thirteen of the twenty-two planning districts within the State are below the federally defined critical shortage level of 6.7 per 100,000. Optometric manpower projections prepared for the Southern Regional Education Board indicate that when such factors as attrition and mobility are taken into consideration, Virginia would need an additional twenty-nine optometrists per year between 1974 and 1990 in order to achieve by 1990 the ratio of 9.1 optometrists per 100,000 which is the current (1974) national ratio of optometrists to population. Comparable figures for neighboring states are Maryland-28, North Carolina-29, and West Virginia-8.

A policy statement on new schools and colleges of optometry, adopted by the Association of Schools and Colleges of Optometry in September 1974 (Appendix A), suggested that new schools should have approximately sixty students in the entering class. The statement additionally recommended that the school be located in a community of at least 200,000 population to provide an adequate clinical base for the program and that the most advantageous location for a new school or college of optometry is in an academic health center. As indicated in Table 19, the potential locations for new schools of optometry (those meeting the Association of Schools and Colleges

of Optometry recommendations) in Virginia and neighboring states include:

Virginia

Virginia Commonwealth University	Richmond
Old Dominion University/Eastern Virginia Medical School	Norfolk

Maryland

Johns Hopkins University	Baltimore
University of Maryland	Baltimore

North Carolina

Bowman Gray-Wake Forest College	Winston-Salem
Duke University	Durham

Forty-two Virginians applied for student places in the 1974 entering classes in the existing twelve schools and colleges of optometry. Eighteen of the applicants, approximately forty-three percent of the candidates, were successful in obtaining admission. During the 1974-75 academic year, fifty-five Virginians were enrolled in five of the existing schools (School of Optometry at the University of Alabama in Birmingham-seven, Illinois College of Optometry-seven, Indiana University-four, Southern California College of Optometry-two, Massachusetts College of Optometry-three, Pennsylvania College of Optometry-seventeen, and Southern College of Optometry-fifteen).

In the fall of 1974, five Virginians (three at the Southern College of Optometry in Memphis, Tennessee, and two at the School of Optometry at the University of Alabama in Birmingham) became the first to be enrolled in contracted student places through a mechanism established in cooperation with the Southern Regional Education Board. Information provided by the

American Optometric Foundation and interviews with Deans of existing schools of optometry indicates the existence of additional contract options. Anticipated cost for such contracted student positions should average approximately \$4,000 per student per year.

Information provided by institutions who have built new or expanded existing facilities and from a constructed cost study of optometric education indicates the approximate cost of building and equipping a new school of optometry designed for an entering class of sixty students to be between eight and ten million dollars. The operating budget of such a fully operation institution (sixty students per class) in 1975 would be approximately 1.9 million dollars.

CONCLUSIONS AND RECOMMENDATIONS

The Committee concludes that neither the number of additional optometrists needed yearly in Virginia to provide the services currently requested by Virginians nor the number of students now seeking admission is sufficient to warrant the establishment of a school or college of optometry in Virginia at this time. The Association of Schools and Colleges of Optometry recommends new colleges of optometry be planned to accommodate an average of sixty students per entering class. A Southern Regional Education Board study indicates Virginia needs twenty-nine new optometrists annually. Many of these needs are met by Virginians studying in existing schools of optometry who return to the State to practice, while additional optometrists are encouraged to establish practices in Virginia by the economy and climate of the Commonwealth.

Recommendation #1. A school of optometry designed solely to meet the optometric manpower needs of Virginians should not be established at this time.

At present, opportunities exist to add to the available student places contracted for in existing schools of optometry. This mechanism guarantees at least a minimum number of places will be available annually for qualified Virginians. Both the Southern Regional Education Board and the non-profit American Optometric Foundation administer programs through which contracts for student places are secured. The Optometry School Study Committee and the Virginia Optometric Association agree that the expansion of contracted student places is an acceptable interim solution to meeting the demand for optometric manpower.

Recommendation #2. Virginia should increase the number of

student places currently contracted for with existing schools and colleges of optometry .

Studies of optometric manpower in the Southeast suggest the combined need of Maryland, North Carolina, Virginia, and West Virginia for additional optometrists is sufficient to warrant the establishment of a regional school of optometry to educate optometric manpower for those states and the District of Columbia. Verbal communication combined with letters received from optometric societies and higher education coordinating agencies in the above states indicate support for the concept of a regional school of optometry .

Recommendation #3. Maryland, North Carolina, Virginia, West Virginia, and Washington, D.C., should initiate planning for a regional school of optometry. Such regional planning must be at the highest level of state government. Therefore, it is further recommended that the Governor of Virginia use his office to initiate such a planning effort .

Location factors substantially influence the quality of the education program provided by schools of optometry. In keeping with recommendations approved by the Board of Directors of the Association of Schools and Colleges of Optometry, the Committee believes any school of optometry established to serve Virginia's need should be developed in an academic health center where it can share the basic science resources of these institutions as well as develop the communications and professional relationships required to best serve the vision requirements of the public .

Recommendation #4. Any regional school of optometry in which the Commonwealth of Virginia participates should be established within an academic health center and located in a metropolitan area .

Ready access to the services for which the ophthalmologist is uniquely qualified should be available to the citizens of the Commonwealth of Virginia .

Recommendation #5. The State Council of Higher Education for Virginia and the Virginia medical schools should investigate the feasibility of increasing the number of ophthalmologic residencies in the State.

The availability of properly trained optometric technicians and ophthalmologic assistants increased the productivity of the independent practitioners with whom these auxiliaries work.

Recommendation #6. An educational program for optometric technicians should be developed in conjunction with any regional school of optometry established. The optometric technician program should be based in a community college.

Recommendation #7. Educational programs for ophthalmologic auxiliaries should be developed by community colleges in conjunction with existing departments of ophthalmology.

Continuing education for practicing optometrists is a high priority for existing schools of optometry. Through continuing education, practitioners learn the latest advances in knowledge, clinical skills, techniques, and instrumentation associated with their profession. Similarly, ophthalmologists and the auxiliaries of both optometrists and ophthalmologists benefit from the ongoing availability of continuing education.

Recommendation #8. High-quality continuing education should be encouraged and made available for practicing optometrists, ophthalmologists, and their auxiliaries.

Many sections of the Commonwealth of Virginia have greater accessibility to the services of an ophthalmologist than is suggested by the current national ratio of ophthalmologists to population. Similarly, the ratio of optometrists to population varies from 1:12,323 in Planning District 19 to 1:59,000 in Planning District 10.

Recommendation #9. Programs should be developed to encourage better distribution of optometrists, ophthalmologists, and other eye care personnel.

Existing research indicates that the productivity of optometrists can be increased by approximately fifty percent by using optometric auxiliaries. Further, statistics gathered by the United States Department of Health, Education, and Welfare indicate an increase in patients seen when optometrists and ophthalmologists have joint practices.

Recommendation #10. The utilization of integrated health care teams including ophthalmologists, optometrists, and their auxiliaries should be encouraged.

Recommendation #11. The Virginia Optometric Association and the Virginia Society for Ophthalmology and Otolaryngology should establish an interprofessional committee to expand dialogue between the two professions.

The 1970 Session of the General Assembly delegated to the State Council of Higher Education for Virginia the responsibility for planning and coordinating all postsecondary educational programs for all health professions and occupations. The Council's responsibilities include making recommendations whereby adequate and coordinated educational programs shall exist to produce the appropriate supply and properly trained health manpower. The Bureau of Vital Records and Health Statistics of the State Department of Health in cooperation with the Virginia State Board of Examiners of Optometry are in the process of devising a system for the ongoing collection of a "minimum data set" of information on optometric manpower.

Recommendation #12. The State Council of Higher Education for Virginia should, in conjunction with its ongoing health manpower planning activities, and in cooperation with appropriate professional, and other State agencies, evaluate the demand for optometrists, ophthalmologists and their auxiliaries on a continuing basis.

FOOTNOTES

¹Dr. Thomas Mou has, during the past two years, chaired a committee of the Association of Academic Health Centers which has explored the relationships of optometrists and ophthalmologists. More recently, Dr. Mou has participated in a Southern Regional Education Board (S.R.E.B.) study on Optometric Education in the South and is currently a participant in a study to determine the feasibility of establishing a regional school of optometry in the New England states.

²From August 1974 through April 1975, Members of the Council Staff visited the School of Optometry at the University of Alabama at Birmingham, the School of Optometry in Memphis, Tennessee, the Pennsylvania School of Optometry in Philadelphia, Pennsylvania, and the Optometric Technologists Program at Miami-Dade Community College in Miami, Florida. Information obtained from faculty and administrators responsible for these programs is incorporated in the body of this report.

³In 1968, the federal government identified a critical shortage area as being those where there are more than 15,000 persons per practicing optometrist (or fewer than 6.7 percent optometrists per 100,000).

⁴The A.S.C.O. Statement on New Schools and Colleges of Optometry (Appendix A) was adopted by the American Optometric Association Council on Optometric Education, April 14, 1975.

APPENDIX A

STATEMENT ON NEW SCHOOLS AND COLLEGES OF OPTOMETRY

Adopted Unanimously by the Board of Directors of
The Association of Schools and Colleges of Optometry
Washington, D.C. September 12, 1974

This statement is prepared to present the conditions the Association of Schools and Colleges of Optometry holds are important to the development of new schools.

1. Under appropriate conditions, the most advantageous location for a new school or college of optometry is in the academic health center of a state university.
2. Optometry should have separate status as a professional school or college, administratively on the same level as medicine and dentistry, within the health center.
3. There should be strong central administrative support for the school or college of optometry and commitment to interdisciplinary development and interaction.
4. There should be shared basic health science programs for students of the health professions where appropriate.
5. There should be the opportunity for development of optometric clinical services in the various patient care facilities of the center.
6. There should be the opportunity to develop interdisciplinary research programs of mutual interest.
7. There should be a commitment to graduate and continuing education for the further development of practicing optometrists and future educators.
8. The size of the entering class of professional students should be approximately 60 students.
9. The school should be located in a community of at least 200,000 population to provide an adequate clinical base for the program.
10. The school should, where possible, be a regional resource for the development of optometric manpower and vision care referral service.
11. There should be a commitment of both adequate capital funds and operating support to provide for the orderly development of a program of excellence in optometric education.
12. There should be an established faculty-student ratio of not less than one faculty member per five students.

Source: Statement of New Schools and Colleges of Optometry. Adopted unanimously by the Board of Directors of the Association of Schools and Colleges of Optometry. Washington, D.C. 1974.

APPENDIX B

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