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LOWER SHIRE VALLEY
OCULAR DISEASE SURVEY

Report on Nutritional Status
and
General Morbidity

April 1985
Ministry of Health
Government of Malawi

Preface

The Lower Shire Valley Ocular Disease survey was conducted as the first phase of an integrated program for the prevention of blindness in this area of Malawi. Its primary objective was to provide baseline data on the magnitude of the problem, the principle causes of blindness and their geographic distribution within the valley. These data now serve as a reference for the design and ultimate evaluation of a series of both short-term and long-term interventions designed to reduce the toll of the three major blinding conditions: cataract, xerophthalmia, and trachoma.

This present report provides further description of the household and child characteristics of the survey population. This report is intended to provide background, cross-sectional data on demographic, socio-economic, nutritional and morbidity characteristics which can be utilized in the planning of health and nutrition programs for communities in the Lower Shire Valley.

Acknowledgments

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INTRODUCTION

The Lower Shire Valley Ocular Disease Survey was carried out from September through November, 1983. The Survey's specific objectives, design, methods, and resources utilized have been fully described in the Manual of Operations (1). Initial ocular disease prevalence rates by age, sex, and other demographic characteristics as well as dietary findings associated with xerophthalmia have been reported in the Lower Shire Valley Ocular Disease Survey Final Report (2) and Executive Summary (3).

This present report on nutritional status and general morbidity of children less than 6 years of age combines data derived from both the entire surveyed child population (N=5436) and a randomly selected 10% sub-sample of children (n=552) which received more intensive assessment for nutritional status (e.g., anthropometry). Whenever possible, throughout the report, data is provided for both the survey population and the random sub-sample in order to establish the representativeness of the latter group. The degree to which the sub-sample approximates the larger survey population on a wide variety of characteristics may be taken to reflect the degree to which the nutritional status of the sub-sample represents that of the larger sample. While some differences do exist between these groups largely due to sampling variation, the distributions of characteristics are sufficiently similar so that the nutritional status profiles presented here may be taken to represent the survey population.

PART 1

**Selected demographic and socio-economic
characteristics of the entire survey
population and the random sub-sample of
households and children.**

SUMMARY OF DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS

Table 1-1 describes the age distributions of the survey and random sub-sample children. There was a slight under representation of infants less than one year of age in the sub-sample. Five-year-old children are uniformly underrepresented in both groups. This is likely to be due, in large part, to the difficulties of precise age determination among children five years of age and older. As seen in Table 1-2, a larger proportion of females than males were examined in both groups indicating a female preponderance among young children in the Lower Shire Valley.

Table 1-3 shows the distribution of households in which young children live, by the numbers of members within the household, for both groups. There was a slight tendency for sub-sample households to be larger than those of the general survey, the median household size being approximately six and five in members, respectively. Households with only one member are excluded from this table by definition. Table 1-4 indicates how the numbers of young children in a household vary by household size. The median number of children less than six years of age is two among households with four through ten members, although there is a clear shift toward more children in a household of increasing size. Eighty percent of all households have either one or two young children, while more than 75% of all children in this age group live in households in which three to seven members live.

Tables 1-5 and 1-6 describe age, education, and occupation characteristics of the heads of households. The head of household was defined as the adult member whom the respondent indicated as the primary economic supporter of the household, whether present or not during the

survey. Approximately 75% of all heads of households are over 30 years of age with slightly more than half ever having attended school. Despite the close proximity of the majority of communities in the valley to the Shire river, the vast majority of heads of households considered farming as their principle occupation, defined as the household-supporting task on which the head of the household worked most of the time. Table 1-7 shows that approximately 75% of all households own chickens. Less than half that proportion own any other type of animal with approximately 1/3 of the households owning goats, and some 10-20% owning cows or pigs. The distributions between the survey and random sub-sample on these various household characteristics are very similar.

TABLE 1-1

Age distributions of the survey population and the random sub-sample of children, less than six years of age, sexes combined, Lower Shire Valley, Malawi, 1983.

Age (years)	Survey		Random sub-sample	
	No.	%	No.	%
<1	1066	19.6	88	15.9
1	959	17.6	99	17.9
2	942	17.3	92	16.7
3	987	18.2	120	21.7
4	909	16.7	95	17.2
5	573	10.5	58	10.5
Total	5436	100.0	552	100.0

TABLE 1-2

Sex distribution of the survey population and the random sub-sample of children, less than six years of age, Lower Shire Valley, Malawi, 1983.

Sex	Survey		Random sub-sample	
	No.	%	No.	%
Male	2597	48.0	255	46.4
Female	2818	52.0	295	53.6
Total	5415 ¹	100.0	550 ²	100.0

¹Excludes 21 missing values

²Excludes 2 missing values

TABLE 1-3

Distributions of households with children less than six years of age by household size, survey population and the random sub-sample, Lower Shire Valley, Malawi, 1983.

Household size (No. of members)	Survey		Random sub-sample	
	No.	%	No.	%
2	34	1.2	1	0.2
3	365	13.0	37	6.0
4	533	18.9	94	17.7
5	475	16.9	79	14.8
6	439	15.6	85	16.0
7	345	12.3	74	13.9
8	223	7.9	45	8.5
9	126	4.5	38	7.1
10	86	3.0	20	3.8
≥11	189	6.7	64	12.0
Total	2815 ¹	100.0	532 ²	100.0

¹Excludes 90 missing values

²Excludes 20 missing values

TABLE 1-4

Distribution of households with children less than six years of age¹ by household size and number of children, survey population, Lower Shire Valley, Malawi, 1983.

Household size (No. of members)	Numbers of children in a household						Total	%
	1	2	3	4	5	≥6		
2	32	1	0	0	0	0	33	1.2
3	335	28	0	2	0	0	365	13.0
4	243	281	7	1	0	0	532	18.9
5	178	246	51	0	1	0	476	16.9
6	137	232	67	4	0	0	440	15.6
7	86	170	74	16	0	0	346	12.3
8	43	98	66	14	1	0	222	7.9
9	19	53	32	20	2	0	126	4.5
10	13	32	26	10	5	0	86	3.0
11	11	21	18	14	3	0	67	2.4
12	4	6	14	12	5	3	44	1.5
≥13	7	10	12	24	10	15	78	2.8
Total	1108	1178	367	117	27	18	2815 ²	100.0
%	39.4	41.8	13.0	4.2	1.0	0.6	100.0	

¹Does not include households of 1 member

²Excludes 90 missing values

TABLE 1-5

Distributions of heads of households by age and proportion, whoever attended school, survey population and the random sub-sample of households, Lower Shire Valley, Malawi, 1983.

Number of heads of households

Characteristic of head of household	Survey		Random sub-sample	
	No.	%	No.	%
Age of head of household (years)				
≤ 30	799	25.6	131	23.7
> 30	2322	74.4	421	76.3
Total	3121	100.0	552	100.0
Schooling of head of household				
Ever	1736	55.8	319	57.9
Never	1374	44.2	232	42.1
Total	3110 ¹	100.0	551 ²	100.0

¹Excludes 11 missing values

²Excludes 1 missing value

TABLE 1-6

Distributions of major occupations of heads of households of the survey population and the random sub-sample of households, Lower Shire Valley, Malawi, 1983.

Occupation of head of household	Number of households		Random sub-sample	
	Survey No.		No.	
Farmer	2553	82.0	435	78.9
Fisherman	172	5.5	34	6.2
Merchant	50	1.6	13	2.4
Other	340	10.9	69	12.5
Total	3115 ¹	100.0	551 ²	100.0

¹Excludes 6 missing values

²Excludes 1 missing value

TABLE 1-7

Distributions of households by types of animals owned, survey population and the random sub-sample, Lower Shire Valley, Malawi, 1983.

Number of households¹

Type of animal owned	Survey		Random sub-sample	
	No.	%	No.	%
Chickens	2300	73.8	417	75.8
Goats	979	31.4	204	37.0
Cows	510	16.4	115	20.9
Pigs	409	13.1	80	14.5

¹Each row number for both the entire survey and the random sample excludes between 1 to 4 missing values.

PART 2

Tables of nutritional status of
random sub-sample of children
less than six years of age,
Lower Shire Valley, Malawi, 1983

SUMMARY OF NUTRITIONAL STATUS

Anthropometric nutritional status was assessed among random sub-sample children less than six years of age by measuring weight on all children, recumbent length on children less than 24 months of age, and standing height on children 24 months of age or older. Complete weight and height or length data by age and sex are available for 537 of the 552 (97.3%) random sub-sample children. A missing value exists for 15 children on at least one of the preceding variables.

Anthropometric measurements were made by a trained public health nurse on each of the three field survey teams. Weight was measured on Salter spring scales which were suspended from a strong support (trees, wooden beams, etc.). All or most clothing and other artifacts were removed from the children who were then placed in a vinyl basket which was hung onto the scale. Weight was read to the nearest 0.1 kg. after the reading was stabilized. Length was measured with the child lying down on the horizontal board. The child's head was gently held in place by an assistant with the crown of the child's head touching the end of the board. Knees were kept straight and the sliding foot block was moved into place by the anthropometrist who read length to the nearest 0.1 cm. Height was measured in a standing position with the child's heels, buttocks, shoulder blades, and back of head touching the back of the board. The sliding block was then lowered to touch the child's head and height was read to the nearest 0.1cm. All length and height readings were taken three times with the average value recorded as the true value.

Child weight and length or height values were compared against the

reference growth curves for American children as published by the National Center for Health Statistics (4). This reference population has been used to provide a basis for international comparison and interpretation. Mean weight and length or height measurements by age and sex are also provided in this report to permit comparison with other reference populations. Derived indicators of nutritional status are: (a) percent of median weight for height to reflect current, acute wasting malnutrition; (b) percent of median height for age, to reflect chronic stunting malnutrition; and, (c) percent median weight for age, which is a composite indicator of protein energy status, reflecting both elements of wasting and stunting nutritional status.

Results

Tables 2-1 and 2-2 provide a summary of combined wasting and stunting malnutrition for both sexes combined and separately. The prevalence of moderate to severe wasting (less than 80% weight for height) was 2.8%. The prevalence of moderate to severe stunting (less than 90% height for age) was 22.3% with 1.3% of the children exhibiting combined moderate to severe wasting and stunting. Unexpectedly, there is a tendency for boys to be both more wasted and stunted than girls (5.4% vs. 2.1% and 26.1% vs. 19.1%, respectively).

Nutritional status is broken down by age in Tables 2-3 through 2-7, by age and male status in Tables 2-8 through 2-12 and by age and female status in Tables 2-13 through 2-17. Each subset of tables presents the specified data in the same format; that is the first two tables describe mean weight and length or height distributions by age, and the following three tables present the distributions of mean percent weight for

height, height for age, and weight for age. Standard errors of the mean (\bar{x}) and standard deviations are given for each age group on each table.

Tables 2-5, 2-10, and 2-15 indicate that the average weight for height status of children is quite acceptable and does not vary by age. The slight tendency for females to be better nourished than males is reflected by five of the six mean weight for height values being greater among girls.

Tables 2-6, 2-11, and 2-16 show a tendency for children to become relatively more stunted with age, the most noticeable departure from the median occurring during the second year of life. Boys are consistently more stunted, on average, than girls at each age group.

The effects of primarily mild to moderate stunting on weight for age can be observed in Tables 2-7, 2-12, and 2-17. Percent of a median weight for age is the nutritional status indicator used to assess children in most under five clinics since the "Under Five Card" is essentially a record of weight for age. These tables indicate a progressive decline in percent weight for age as children get older. The decline is more evident in boys, and most dramatic among boys one year of age (Table 2-12).

Table 2-18 examines the relationship between wasting malnutrition and distance of the village from the local river, either the Shire river or one of its tributaries. This aspect was explored because of the tendency for trachoma and Bitot's spots to increase with distance from the river. No consistent association is observed. The most well-nourished segment of the population appears to reside between 2 to 4 kilometers

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from the river which generally corresponds to the communities closest to the major trunk road throughout much of the valley.

TABLE 2-1

Waterlow classification of nutritional status by percent of NCHS median weight for height and height for age, sexes combined, for children less than 6 years of age, Lower Shire Valley, Malawi, 1983.

Percent weight for height	Percent height for age			Total
	≥ 95%	94-90%	< 90%	
≥ 100%	95 (17.7)	74 (13.8)	44 (8.2)	213 (39.7)
99 - 90%	91 (17.0)	89 (16.6)	45 (8.4)	225 (41.9)
89 - 80%	29 (5.4)	31 (5.8)	24 (4.5)	64 (11.9)
< 80%	3 (0.6)	5 (0.9)	7 (1.3)	15 (2.8)
Total	218 (40.6)	199 (37.1)	120 (22.3)	537 (100.0) ¹

¹Excludes 15 missing values

TABLE 2-2

Waterlow classification of nutritional status by percent of NCHS median weight for height and height for age, by sex, for children less than 6 years of age, Lower Shire Valley, Malawi, 1983.

MALE

Percent median height for age

Percent median weight for height	≥ 95%	94-90%	<90%	Total
≥ 100%	33 (13.3)	36 (14.5)	22 (8.8)	91 (38.8)
99 - 90%	39 (15.7)	39 (15.7)	26 (10.4)	104 (39.8)
89 - 80%	14 (5.6)	17 (6.8)	14 (5.6)	45 (16.0)
< 80%	2 (0.8)	4 (1.6)	3 (1.2)	9 (5.4)
Total	88 (35.3)	96 (38.6)	52 (26.1)	249 (100.0)

FEMALE

Percent median height for age

Percent median weight for height	≥ 95%	94-90%	< 90%	Total
≥ 100%	62 (21.5)	38 (13.2)	22 (7.6)	122 (42.4)
99 - 90%	52 (18.1)	50 (17.4)	19 (6.6)	121 (42.0)
89 - 80%	15 (5.2)	14 (4.9)	10 (3.5)	39 (13.5)
< 80%	1 (0.4)	1 (0.4)	4 (1.4)	6 (2.1)
Total	130 (45.1)	103 (35.8)	55 (19.1)	288 (100.0)

TABLE 2-3

Weight status by age, sexes combined, for children less than 6 years of age, Lower Shire Valley, Malawi, 1983.

Age (years)	Weight (kg)			
	Number	Mean (\bar{x})	Standard error of \bar{x}	Standard deviation
<1	88	6.39	0.20	1.91
1	96	8.94	0.15	1.44
2	91	11.57	0.19	1.79
3	118	13.13	0.18	2.00
4	94	15.28	0.26	2.49
5	58	16.33	0.26	2.00

TABLE 2-4

Length or height status by age, sexes combined, for children less than 6 years of age, Lower Shire Valley, Malawi, 1983.

Length or height (cm)				
Age (years)	Number	Mean (\bar{X})	Standard error of \bar{X}	Standard deviation
<1	87	62.36 ¹	0.82	7.63
1	98	74.84 ¹	0.52	5.13
2	92	83.46	1.01	9.71
3	120	90.40	0.54	5.92
4	95	98.70	0.79	7.74
5	58	103.59	0.67	5.10

¹Length was measured on children less than 2 years of age.

TABLE 2-5

Percent NCHS median weight for height status by age, sexes combined, for children less than 6 years of age, Lower Shire Valley, Malawi, 1983.

Percent median weight for height

Age (years)	Number	Mean (\bar{x})	Standard error of \bar{x}	Standard deviation
<1	83	101.83	1.20	10.92
1	94	93.15	0.95	9.24
2	90	97.52	1.07	10.11
3	118	99.39	0.92	10.02
4	94	99.44	1.00	9.60
5	58	98.32	0.97	7.35

TABLE 2-6

Percent NCHS median height for age status by age, sexes combined, for children less than 6 years of age, Lower Shire Valley, Malawi, 1983.

Percent median height for age

Age (years)	Number	Mean (\bar{x})	Standard error of \bar{x}	Standard deviation
<1	86	96.49	0.65	6.02
1	97	93.11	0.47	4.67
2	92	93.48	1.09	10.50
3	120	92.65	0.52	5.73
4	95	93.51	0.70	6.81
5	58	92.91	0.58	4.38

TABLE 2-7

Percent NCHS median weight for age status by age, sexes combined, for children less than 6 years of age, Lower Shire Valley, Malawi, 1983.

Percent median weight for age

Age (years)	Number	Mean (\bar{x})	Standard error of \bar{x}	Standard deviation
<1	87	93.07	1.71	15.96
1	95	82.20	1.14	11.11
2	91	88.23	1.29	12.29
3	118	86.82	1.14	12.39
4	94	88.74	1.41	13.67
5	58	86.66	1.41	10.77

TABLE 2-8

Weight status by age, for male children less than 6 years of age, Lower Shire Valley, Malawi, 1983.

Age (years)	Weight (kg)			
	Number	Mean (\bar{x})	Standard error of \bar{x}	Standard deviation
<1	42	6.31	0.29	1.90
1	42	9.00	0.24	1.57
2	42	11.51	0.29	1.88
3	45	13.33	0.35	2.33
4	52	15.43	0.35	2.54
5	29	16.21	0.36	1.95

TABLE 2-9

Length or height status by age, for male children less than 6 years of age, Lower Shire Valley, Malawi, 1983.

Length or height (cm)				
Age (years)	Number	Mean (\bar{x})	Standard error of \bar{x}	Standard deviation
<1	41	62.41 ¹	1.20	7.69
1	43	74.72 ¹	0.68	4.47
2	43	82.29	2.00	13.15
3	47	90.36	0.88	6.01
4	52	98.42	1.14	8.24
5	29	103.64	0.94	5.05

¹Length was measured on children less than 2 years of age.

TABLE 2-10

Percent NCHS median weight for height status by age, for male children less than 6 years of age, Lower Shire Valley, Malawi, 1983.

Percent median weight for height

Age (years)	Number	Mean (\bar{x})	Standard error of \bar{x}	Standard deviation
<1	40	99.2	1.8	11.5
1	42	92.5	1.6	10.2
2	41	96.1	1.7	10.6
3	45	99.3	1.5	10.2
4	52	100.1	1.5	10.7
5	29	96.3	1.2	6.4

TABLE 2-11

Percent NCHS median height for age status by age, among male children less than 6 years of age, Lower Shire Valley, Malawi, 1983.

Percent height for age

Age (years)	Number	Mean (\bar{x})	Standard error of \bar{x}	Standard deviation
<1	41	96.4	0.9	5.6
1	43	92.1	0.6	4.2
2	43	91.6	2.1	14.0
3	47	91.9	0.8	5.8
4	52	92.6	1.0	7.2
5	29	92.4	0.8	4.4

TABLE 2-12

Percent NCHS median weight for age status by age, for male children less than 6 years of age, Lower Shire Valley, Malawi, 1983.

Percent weight for age

Age (years)	Number	Mean (\bar{x})	Standard error of \bar{x}	Standard deviation
<1	42	91.1	2.5	16.0
1	42	80.1	1.8	11.4
2	42	85.8	1.8	11.8
3	45	85.8	2.1	14.1
4	52	87.7	1.9	13.4
5	29	83.8	1.9	10.0

TABLE 2-13

Weight status by age, for female children less than 6 years of age, Lower Shire Valley, Malawi, 1983.

Age (years)	Weight (kg)			
	Number	Mean (\bar{x})	Standard error of \bar{x}	Standard deviation
<1	45	6.46	0.29	1.96
1	53	8.87	0.19	1.35
2	49	11.62	0.25	1.73
3	73	13.00	0.20	1.74
4	47	15.08	0.37	2.43
5	29	16.45	0.39	2.08

TABLE 2-14

Length or height status by age, for female children less
less than 6 years of age, Lower Shire Valley, Malawi, 1983.

Length or height (cm)				
Age (years)	Number	Mean (\bar{x})	Standard error of \bar{x}	Standard deviation
<1	45	62.28 ¹	1.15	7.75
1	54	74.82 ¹	0.77	5.65
2	49	84.50	0.72	5.01
3	73	90.43	0.69	5.91
4	43	99.05	1.10	7.18
5	29	103.54	0.97	5.23

¹Length was measured on children less than 2 years of age.

TABLE 2-15

Percent NCHS median weight for height status by age for female children less than 6 years of age, Lower Shire Valley, Malawi, 1983.

Percent median weight for height

Age (years)	Number	Mean (\bar{x})	Standard error of \bar{x}	Standard deviation
<1	43	104.3	1.5	9.8
1	52	93.7	1.2	8.5
2	49	98.7	1.4	9.6
3	73	99.4	1.2	10.0
4	42	98.7	1.2	8.0
5	29	100.3	1.5	7.8

TABLE 2-16

Percent NCHS median height for age status by age, for female children less than 6 years of age, Lower Shire Valley, Malawi, 1983.

Percent median height for age

Age (years)	Number	Mean (\bar{X})	Standard error of \bar{X}	Standard deviation
<1	45	96.5	1.0	6.5
1	54	93.9	0.7	4.9
2	49	95.1	0.8	5.5
3	73	93.1	0.7	5.7
4	43	94.6	0.9	6.2
5	29	93.4	0.8	4.4

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TABLE 2-17

Percent NCHS median weight for age status by age, for female children less than 6 years of age, Lower Shire Valley, Malawi, 1983.

Percent weight for age

Age (years)	Number	Mean (\bar{x})	Standard error of \bar{x}	Standard deviation
<1	45	94.9	2.4	15.9
1	53	83.8	1.5	10.7
2	49	90.3	1.8	12.4
3	73	87.4	1.3	11.3
4	42	90.1	2.2	14.0
5	29	89.6	2.0	11.0

TABLE 2-18

Percent of NCHS median weight for height status by distance from the nearest river, children less than six years of age, random subsample, Lower Shire Valley, Malawi, 1983.

Distance from river (km)	No.	Percent median weight for height							
		≥ 100%		99-90%		89-80%		< 80%	
		n	%	n	%	n	%	n	%
≤1	157	58	36.9	71	45.2	21	13.4	7	4.5
2-4	109	55	50.5	37	33.9	15	13.8	2	1.8
≥5	271	100	36.9	117	43.2	48	17.7	6	2.2
Total	537 ¹	213	39.7	225	41.9	84	15.6	15	2.8

¹Excludes 15 missing values

PART 3

General morbidity patterns among
children less than 6 years of age
in the entire survey population and
the random sub-sample.

SUMMARY OF GENERAL MORBIDITY PATTERNS

Childhood morbidity was assessed by inquiring about the presence or absence of diarrhea, fever, or cough during the previous seven days. A history for diarrhea was considered positive if the child reportedly had four or more loose stools during at least one day during this period. In addition, children attending the central sight were examined for the presence of a measles rash, and parents of children were asked if a child had ever had measles.

The one week period prevalence of diarrhea fever, and cough by age among both survey and sub-sample groups are given in Tables 3-1, 3-2, and 3-3. The prevalence of diarrhea is highest among infants and children one year of age, which then steadily declines after the second year of life. Similarly, the prevalence fever is highest during the first two years of life, with approximately half of all surveyed children under two years of age reporting to have had fever during the previous week. Thereafter, a decline in the prevalence of fever is observed but is less dramatic than that seen with diarrhea. Approximately 30-40% of children less than six years of age report coughing symptoms irrespective of age. Taken together, these data indicate a substantial burden of morbidity among young children in the Lower Shire Valley.

The prevalence of measles was extremely low during the survey, with less than 0.1% of the children presenting with a rash (Table 3-4). The proportions of children reported to have ever had measles by age are given in Table 3-5. Very few infants have had measles but the proportion increases markedly during the second year of life. By age five years, between 35 and 40% of the children have reported to have had

measles. This is most certainly an underestimate since only children who survive measles were included in the survey.

TABLE 3-1

Age-specific one week period prevalence of diarrhea, children less than 6 years of age, survey population and random sub-sample, Lower Shire Valley, Malawi, 1983.

Age (years)	Survey			Random sub-sample		
	No.	n	%	No.	n	%
<1	1067	268	25.1	88	18	31.8
1	957	237	24.8	98	22	22.5
2	943	152	16.1	92	13	14.1
3	987	111	11.1	120	13	10.8
4	908	57	6.3	95	5	5.3
5	570	49	8.6	58	2	3.5
Total	5432	874	16.1	551	83	15.1

TABLE 3-2

Age-specific one week period prevalence of fever, among children less than 6 years of age, survey population and the random sub-sample, Lower Shire Valley, Malawi, 1983.

Age (years)	Fever			Fever		
	Survey			Random sub-sample		
	No.	n	%	No.	n	%
<1	1067	526	49.3	88	41	46.6
1	937	489	51.1	98	56	57.1
2	941	388	41.2	92	36	39.1
3	987	379	38.4	120	54	45.0
4	908	321	35.4	95	34	35.8
5	569	199	35.0	58	16	27.6
Total	5429	2302	42.4	551	137	43.0

TABLE 3-3

Age-specific one week period prevalence of cough, children less than 6 years of age, survey population and random sub-sample, Lower Shire Valley, Malawi, 1983.

Age (years)	Cough			Cough		
	Survey			Random sub-sample		
	No.	n	%	No.	n	%
<1	1065	428	40.2	551	201	36.5
1	957	366	38.2	98	38	38.8
2	942	312	33.1	92	35	38.0
3	987	317	32.1	120	41	34.2
4	908	292	32.2	95	36	37.9
5	568	162	28.5	58	15	25.9
Total	5427	1877	34.6	551	201	36.5

TABLE 3-4

Age-specific prevalence of measles rash at time of examination, survey children less than 6 years of age, by sex, Lower Shire Valley, Malawi, 1983.

Age (years)	<u>Measles</u>								
	Male			Female			Total		
	No.	n	%	No.	n	%	No.	n	%
<1	507	0	0.0	546	0	0.0	1061	0	0.0
1	455	1	0.22	492	0	0.0	952	1	0.11
2	478	1	0.23	508	2	0.39	939	3	0.32
3	484	0	0.0	493	0	0.0	980	0	0.0
4	429	0	0.0	478	0	0.0	907	0	0.0
5	282	1	0.35	289	0	0.0	573	1	0.17
Total	2585 ¹	3	0.12	2806 ¹	2	0.07	5412 ²	5	0.09

¹Excludes 21 missing values for sex which are included in the "Total"

²Excludes 24 missing values for measles diagnosis

TABLE 3-5

Age-specific distribution of children less than 6 years of age who have ever had measles, survey population and the random sub-sample, Lower Shire Valley, Malawi, 1983.

Age (years)	<u>Ever had measles</u>			Random sub-sample		
	Survey No.	n	%	No.	n	%
<1	1065	13	1.2	88	1	1.1
1	958	128	13.4	97	15	15.5
2	943	155	16.4	92	18	19.6
3	986	226	22.9	120	30	25.0
4	907	227	25.0	95	30	31.6
5	570	198	34.7	58	24	41.4
Total	5432	947	17.4	550	118	21.5

REFERENCES

1. Lower Shire Valley Eye Disease Survey, Manual of Operations, Ministry of Health, Government of Malawi, 1983.
2. Lower Shire Valley Ocular Disease Survey, Final Report, Ministry of Health, Government of Malawi, 1984.
3. Lower Shire Valley Ocular Disease Survey, Executive Summary, Ministry of Health, Government of Malawi, 1984.
4. Hamill PVV. Drizid TA, Johnson CL, Reed RB. Roche AF. NCHS Growth Curves for Children Birth -18 Years, DHEW Publication No. (PHS) 78-1650, U.S. Department of Health, Education and Welfare, Public Health Service, National Center for Health Statistics, November, 1977.

Appendix J

SUMMARY FINANCIAL STATEMENT

INTERNATIONAL EYE FOUNDATION

MATCHING GRANT NUMBER PDC-0174-G-SS-1102-00

1981 - 1985

DETAILS OF MATCHING GRANT EXPENDITURES

U.S.A.I.D. / I.E.F.

1981 - 1985

COUNTRY	MATCHING GRANT (U.S.A.I.D.)					MATCHING GRANT (I.E.F.)				
	81-82	82-83	83-84	84-85	TOTAL	81-82	82-83	83-84	84-85	TOTAL
Egypt	7,119.56	15,372.25	4,801.38	0	27,293.19	1,465.39	6,218.11	9.12	0	7,692.62
Guinea	18,944.17	62,772.68	38,665.21	4,587.00	124,969.06	24,671.46	42,045.37	7,418.07	1,131.34	75,266.24
Haiti	6,871.16	0	0	0	6,871.16	1,730.45	0	0	0	1,730.45
Honduras	10,007.17	20,654.62	3,214.00	39,320.92	73,196.71	14,875.23	11,774.16	10,796.36	22,055.40	59,501.15
Malawi	21,656.36	94,989.68	114,322.89	161,453.20	392,422.13	25,460.62	17,467.66	52,754.18	5,118.82	100,801.28
Puerto Rico	6,924.13	0	0	0	6,924.13	14,563.17	27,084.13	41,854.07	30,701.19	114,202.56
Kenya	0	0	38,322.77	56,950.04	95,272.81	0	0	27,191.05	65,914.74	93,105.79
St. Lucia	0	0	29,548.12	47,671.03	77,219.15	0	0	52,881.89	20,983.20	73,865.09
Bethesda *	14,523.93	37,322.48	43,985.25	0	95,831.66	42,293.46	72,742.53	114,686.70	157,876.06	387,598.75
TOTAL	86,046.48	231,111.71	272,859.62	309,982.19	900,000.00	125,059.78	177,331.96	307,591.44	303,780.75	913,763.93

* During the first three years of this grant, all G. & A. expenditures were charged to Bethesda. Starting in 1984-85, when computerized accounting procedures were instituted, allocations of G. & A. expenditures were made on a country-by-country basis.

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Appendix K

AUDITED STATEMENT OF ACCOUNTS

INTERNATIONAL EYE FOUNDATION

FISCAL YEAR 1984 - 1985

INTERNATIONAL EYE FOUNDATION

FINANCIAL STATEMENTS AND INDEPENDENT AUDITORS' REPORT

JUNE 30, 1985

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INTERNATIONAL EYE FOUNDATION

FINANCIAL STATEMENTS

JUNE 30, 1985

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THOMAS HAVEY & CO.

CERTIFIED PUBLIC ACCOUNTANTS

4301 Connecticut Avenue N.W., Washington, D.C. 20008 • 202/966-6602

Members of the American Institute of Certified Public Accountants

INDEPENDENT AUDITORS' REPORT

To the Board of Directors of
International Eye Foundation
Bethesda, Maryland

We have examined the balance sheet of International Eye Foundation as of June 30, 1985 and the related statements of revenue, expenses and changes in fund balances and of functional expenses for the year then ended. Our examination was made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the financial statements referred to above present fairly the financial position of International Eye Foundation as of June 30, 1985, and the results of its operations and changes in fund balances for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Thomas Havey & Co.

August 14, 1985

INDEPENDENT AUDITORS' REPORT

To the Board of Directors of
International Eye Foundation
Bethesda, Maryland

We have examined the balance sheet of International Eye Foundation as of June 30, 1985 and the related statements of revenue, expenses and changes in fund balances and of functional expenses for the year then ended. Our examination was made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

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August 14, 1985

INTERNATIONAL EYE FOUNDATIONBALANCE SHEETJUNE 30, 1985

	<u>Unrestricted Fund</u>	<u>Restricted Funds</u>	<u>Total</u>
<u>ASSETS</u>			
Current assets:			
Cash in checking accounts	\$ 101,537	\$ 74,597	\$ 176,134
Cash in interest-bearing accounts	329,989	270,769	600,758
Marketable securities (market value - \$61,914) (Note 1c)	55,146	-	55,146
Interfund receivables (payables)	18,718	(18,718)	-
Accrued interest receivable	-	12,756	12,756
Miscellaneous receivables	24,186	-	24,186
Prepaid expenses	11,223	-	11,223
Total current assets	<u>540,799</u>	<u>339,404</u>	<u>880,203</u>
Fixed assets:			
Vehicles	19,000	-	19,000
Office furniture and equipment	39,328	-	39,328
	<u>58,328</u>	<u>-</u>	<u>58,328</u>
Less: Accumulated depreciation	(31,270)	-	(31,270)
Net fixed assets (Note 1d)	<u>27,058</u>	<u>-</u>	<u>27,058</u>
Other assets:			
Inventory of donated medical supplies (Note 6)	310,935	-	310,935
Rental real estate (Note 3)	120,000	-	120,000
Mortgage notes receivable	-	181,533	181,533
Deposits	1,782	-	1,782
Total other assets	<u>432,717</u>	<u>181,533</u>	<u>614,250</u>
Total assets	<u>\$ 1,000,574</u>	<u>\$ 520,937</u>	<u>\$ 1,521,511</u>
<u>LIABILITIES AND FUND BALANCES</u>			
Current liabilities:			
Accounts payable	\$ 66,429	\$ -	\$ 66,429
Deferred income	3,150	-	3,150
Due to Agency for International Development - net (Notes 1b and 2)	-	77,023	77,023
Unexpended endowment fund income	-	57,315	57,315
Total current liabilities	<u>69,579</u>	<u>134,338</u>	<u>203,917</u>
Fund balances:			
Unrestricted fund balance	930,995	-	930,995
The William M. and Ramona N. Carrigan Endowment Fund for Restoring Sight in Latin America	-	386,599	386,599
Total fund balances - Exhibit "B"	<u>930,995</u>	<u>386,599</u>	<u>1,317,594</u>
Total liabilities and fund balances	<u>\$ 1,000,574</u>	<u>\$ 520,937</u>	<u>\$ 1,521,511</u>

See accompanying notes to financial statements.

INTERNATIONAL EYE FOUNDATIONSTATEMENT OF REVENUE, EXPENSES AND CHANGES IN FUND BALANCESYEAR ENDED JUNE 30, 1985

	<u>Unrestricted Fund</u>	<u>Restricted Funds</u>	<u>Total</u>
Public support and revenue:			
Public support:			
Received directly:			
Contributions and grants	\$ 340,755	\$ 80,079	\$ 420,834
Donated medical supplies (Note 6)	2,981,273	-	2,981,273
Fund raising events - net of direct expenses of \$43,215	30,336	-	30,336
Total received directly	<u>3,352,364</u>	<u>80,079</u>	<u>3,432,443</u>
Received indirectly:			
Allocated by the International Service Agencies	103,226	-	103,226
Total public support	<u>3,455,590</u>	<u>80,079</u>	<u>3,535,669</u>
Grants from governmental agencies	<u>-</u>	<u>1,000,655</u>	<u>1,000,655</u>
Other revenue:			
Dues	9,322	-	9,322
Rental income (Note 3)	7,492	-	7,492
Interest and dividends	30,822	-	30,822
Endowment income expended (Note 1b)	-	41,402	41,402
Miscellaneous	5,993	-	5,993
Total other revenue	<u>53,629</u>	<u>41,402</u>	<u>95,031</u>
Total public support and revenue	<u>3,509,219</u>	<u>1,122,136</u>	<u>4,631,355</u>
Expenses - Exhibit "C":			
Program services:			
Operational programs	<u>3,126,164</u>	<u>1,042,057</u>	<u>4,168,221</u>
Supporting services:			
General and administrative	79,613	-	79,613
Fund raising	95,111	-	95,111
Total supporting services	<u>174,724</u>	<u>-</u>	<u>174,724</u>
Total expenses	<u>3,300,888</u>	<u>1,042,057</u>	<u>4,342,945</u>
Excess of public support and revenue over expenses	208,331	80,079	288,410
Fund balance at beginning of year	<u>722,664</u>	<u>306,520</u>	<u>1,029,184</u>
Fund balance at end of year	<u>\$ 930,995</u>	<u>\$ 386,599</u>	<u>\$ 1,317,594</u>

See accompanying notes to financial statements.

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INTERNATIONAL EYE FOUNDATION
STATEMENT OF FUNCTIONAL EXPENSES
YEAR ENDED JUNE 30, 1985

	<u>Program Services</u>		<u>Supporting Services</u>		<u>Total Expenses</u>
	<u>Operational Programs</u>	<u>General and Administrative</u>	<u>Fund Raising</u>		
Salaries	\$ 386,711	\$ 121,928	\$ 37,994	\$ 546,633	
Payroll taxes	15,072	8,551	2,282	25,905	
Retirement plan contributions (Note 5)	31,381	9,938	2,716	44,035	
Other employee fringe benefits	27,388	10,368	2,106	39,862	
Temporary help	5,815	809	183	6,807	
Consultants	45,262	570	5,118	50,950	
Professional fees	1,947	9,031	10,137	21,115	
Stipends and fellowships	98,650	-	-	98,650	
Medical supplies and equipment (Note 6)	3,050,786	-	-	3,050,786	
Equipment rent and maintenance	19,619	3,440	-	23,059	
Office supplies and expense	11,574	5,922	8,333	25,829	
Telephone	3,898	6,936	89	10,923	
Postage, shipping and storage	38,667	4,878	-	43,545	
Teaching materials and training	114,383	-	-	114,383	
Rents	13,681	28,980	-	42,661	
Insurance	6,780	6,273	64	13,117	
Books, publications, dues and registration fees	2,476	5,772	11	8,259	
Travel, project per diems and medical meetings	107,972	8,451	7,716	124,139	
Membership dues - International Service Agencies	-	-	10,000	10,000	
Depreciation (Note 1d)	-	3,468	-	3,468	
Surveys and evaluations	5,276	-	-	5,276	
Vehicle purchases and expenses	28,499	-	-	28,499	
Miscellaneous	265	1,584	3,195	5,044	
Allocation of general and administrative costs	<u>152,119</u>	<u>(157,286)</u>	<u>5,167</u>	<u>-</u>	
Totals	<u>\$ 4,168,221</u>	<u>\$ 79,613</u>	<u>\$ 95,111</u>	<u>\$ 4,342,945</u>	

See accompanying notes to financial statements.

INTERNATIONAL EYE FOUNDATION

NOTES TO FINANCIAL STATEMENTS

JUNE 30, 1985

Note 1. Summary of Significant Accounting Policies

- a. Method of Accounting - The financial statements have been prepared using the accrual basis of accounting.
- b. Restricted Funds - Restricted grant and contract funds are reported as revenue and expenses when expended. Funds received prior to being expended are reported as a liability on the balance sheet until expended (see Note 2). Endowment fund income restricted for specific programs is also reported as revenue and expenses when expended.
- c. Marketable Securities - Marketable securities are recorded at cost or, in case of securities received as gifts, at the fair market value at the date of donation.
- d. Fixed Assets - Fixed assets are recorded at cost in the Unrestricted Fund and depreciation is computed on the straight-line method at rates calculated to prorate the cost over the estimated useful lives, which are three years for vehicles and ten years for office furniture and equipment. Fixed assets purchased with restricted grant funds are charged as an expense of the grant when purchased. If the fixed assets are to become the property of the Foundation upon the completion of the grant, the asset is also capitalized in the Unrestricted Fund and depreciated as stated above.

Note 2. A.I.D. Grants

The Agency for International Development (A.I.D.) has made several grants to the International Eye Foundation so that the Foundation can continue to provide American ophthalmological technology and surgical, medical and educational expertise to selected countries that have a high prevalence of eye disease and a shortage of trained medical personnel necessary to provide prevention, treatment and training.

A summary of the activity in the A.I.D. grants during the year ended June 30, 1985 follows:

	Due to (From) A.I.D. at 6/30/84	Grant Receipts	Grant Expenditures	Due to (From) A.I.D. at 6/30/85
Core Grant II	\$ 7,729	\$ -	\$ -	\$ 7,729
Matching Grant	1,829	300,000	301,829	-
Dominican Republic Operational Pro- gram Grant	18,009	176,060	193,131	938
Egypt Program	32,627	115,598	136,417	11,808
Caribbean Eye Care Program	826	105,000	78,465	27,361
Guinea Integrated Eye Health Project	-	150,000	143,146	6,854
Grenada Blindness Prevention and Treatment Project	-	170,000	147,667	22,333
Total	<u>\$ 61,020</u>	<u>\$ 1,016,658</u>	<u>\$ 1,000,655</u>	<u>\$ 77,023</u>

Core Grant II - The period of performance for this grant expired August 28, 1981. The amount of \$7,729 remains due to A.I.D.

Matching Grant - Under the grant, the Foundation was to survey the extent and causes of blindness, plan and design effective systems for delivery of eye care, and provide training for the treatment of eye diseases in Honduras, Haiti, Guinea, Malawi, Egypt, Puerto Rico, and the Ivory Coast. A.I.D. has agreed to match amounts spent by the Foundation for these services. The total grant of \$900,000 was to cover a four-year period which began July 1, 1981. As of June 30, 1985, an aggregate of \$1,804,611 had been expended on this project, of which \$900,000 was provided by this grant.

Dominican Republic Operational Program Grant - Under this grant, the Foundation is to provide training to improve the capacity of the Government of Dominican Republic health personnel to provide health care services. The grant covers a period from August 19, 1982 through September 30, 1985. The total grant is \$415,000 of which \$397,385 has been received and \$396,447 has been expended as of June 30, 1985.

Egypt Program - Under this grant, the Foundation is to assist the Egyptian Ministry of Health in upgrading the eye health care capability of physicians, paramedical health care workers and other identifiable sources. The Program will design and promote preventive and therapeutic eye health care programs. The grant covers a period from June 15, 1983 through September 30, 1985. The total grant is \$309,405 (an additional amount is provided in local currency to the Foundation's field office and total funding is subject to the availability of funds at A.I.D.). As of June 30, 1985, \$403,947 has been received (including \$94,542 received by the field office) and the program has incurred expenses of \$392,139.

Caribbean Eye Care Program - Under this grant, the Foundation is to provide an adequate level of eye care services to selected Caribbean countries and training to various health personnel of these countries as intermediate eye care specialists and assistants. The grant covers a period from July 1, 1983 through June 30, 1986. The total grant is \$250,000 of which \$130,000 has been received and \$102,639 has been expended as of June 30, 1985.

Guinea Integrated Eye Health Project - Under this \$150,000 grant, the Foundation is to assist the Government of Guinea to complete an eye clinic which will serve as the tertiary care facility and training center for health workers in prevention of blindness activities. The grant expires September 30, 1985. Through June 30, 1985, \$143,146 had been expended.

Grenada Blindness Prevention and Treatment Project - The purpose of this grant is to assist the Government of Grenada in the provision of preventive and curative eye health services throughout Grenada. The grant is for \$400,000 and covers the period from June 30, 1984 to December 31, 1987. As of June 30, 1985, \$147,667 had been expended.

Note 3. Rental Real Estate

In January, 1970 the Foundation received a donation of land located on River Road in Montgomery County, Maryland. The land was recorded at its fair market value at that time based on a lease agreement under which the lessee had an option to buy the property in 1972 for \$120,000.

Note 4. Income Taxes

The Foundation is exempt from Federal income taxes under Section 501(c)(3) of the Internal Revenue Code.

Note 5. Pension Plan

The Foundation has a pension plan to provide retirement benefits for employees who have met the length of service and age requirements. The plan is a defined contribution trustee plan. The contribution to the plan is based upon specific percentages of salaries.

Note 6. Donated Medical Supplies

The Foundation has received contributions in the form of medical supplies to be used in various eye care programs. The donated supplies are recorded at the fair market value established by the donors at the time of the gift. A total of \$117,332 of medical supplies were on hand at June 30, 1984. In addition, medical supplies in the amount of \$2,981,273 were received during the year ended June 30, 1985. Of these supplies, \$310,935 were on hand at June 30, 1985 and \$2,787,670 is included as expenses (medical supplies and equipment) on Exhibit "C". The inventory at June 30, 1985 consists of contact lenses, eye sutures, cataract glasses and other miscellaneous medical supplies which have been restricted for use only for charitable purposes in the Foundation's various eye programs, and cannot be sold or exchanged for property or services.

Note 7. Lease Commitment

The Foundation has entered into a lease for office space which requires monthly lease payments of \$2,415 until the lease expires on October 31, 1986.

Appendix L

ANNUAL REPORT, 1984-1985