HEART DISEASES AMONG SCHOOL PUPILS IN U. A. R.

PART 1

(Age, Sex and Geographical Distribution)

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Introduction

The Ministry of Health in cooperation with The Institute of Statistical Studies and Research planned and conducted a nation wide School Health Survey during 1967. A 10 % representative sample of school pupils of both sexes was chosen from the age group 6-18 years among those enrolled inpublic primary, preparatory and secondary schools in 18 governorates in U. A. R. The sample chosen by the stratified proportionate random technique, included 118, 322 pubpils.

The objective of the survey was to provide information of the health stutus of the pupils and the prevalent diseases with the underlying possible effective factors. The results are needed as a base for the planning of future school health programs and to put standards for future references.

The study of the heart diseases was a part of the suvey to describe the magnitude of the problem, the age, sex distribution, the urban and rural distribution and also the relation to the physical growth of the pubpils.

The chosen sample was classified by age, sex by governorates as well as by urban and rural areas. The Cairo and Alexandria governorates are considered totally urban. In all other governorates, urban areas were taken as the capitals of these governorates and the rest was considered rural.

In such type of nation wide survey, standardization is of at most importance to minimize the observed error. Physicians were responsible for the clinical examination of the heart and chest. The age and sex were taken from the school records. The height and weight were measured by trained health visitors under the direct supervision of the physician in charge of the medical team.

This work is sponsored by ISSR through an agreement with NCHS No. NCHS — UAR — 9.

The measurement of the height was taken while the pupil stood erect and bare-footed. The head marker was kept at right angle to the stand and touched the top of the head tightly. The reading was checked twice before recording to the nearest cm.

The measurement of the weight was recorded to the nearest kg. with the pupil barefooted and only with the underwears. Double checking was required before recording.

Many other informations were recorded in a special file for each pupil related to other parts of the survey.

On a nation wide basis, the field work was periodically inspected and checked by experiencec specialists in cardiology.

The recorded informations were analysed by the ICL, 1905 E at the «Scientic Computation Center, Cairo University».

The distribution of the selected sample according to age, sex, urban and rural is shown in table (1) and the percent attendance in table (11). The distribution by governorates for each sex, urban and rual areas is presented in table (III), (figures 1-3).

The relative percent distribution of the sample by sex, age and rural versus urban areas is presented in table (IV).

This paper is concerned with the results related to the magnitude of the problem of heart diseases among the examined sample. It includes also age, sex, localities distribution and urban versus rural areas.

Results

From table (1), it is observed that the number of pupils included in the sample was almost the same to age of 12 years where a peak is noticed. The number then drop gradually with another peak at age of 16 years. These two peaks represent the end of the primary and preparatory school grades respectively where attendance and enrollment is expected to be higher.

The number of males is observed to be always higher compared to females in all ages especially from 12 years of age and onwards. Such notice is expecteb because more males continue in preparatory and secondary schools. The overal male to female ratio is 2 : 1 and is close to 5 : 4 up to age of 11 years then male ratio increases. It must be noted here that the male to famle ratio is close in rurel than urban areas for all ages.

TABLE 1

Size of 10% Random Subsample of School Children by Age and Sex in Urban and Rural Areas in U. A. R.

	Urban			Rural			Total		
Age	Male	Female	Total	Male	Female	Total	Male	Female	Total
6	4177	3075	7252	1018	757	1775	5195	3832	9027
7	4718	3946	8664	1378	1190	2566	6094	5136	11230
8	4483	3259	7742	1356	810	2166	5839	4069	9908
9	4635	3413	8048	1661	891	2552	6296	4304	10600
10	4440	3210	7650	1456	879	2335	5896	4089	9985
11	4474	3027	7501	1166	787	1953	5640	3814	9454
12	6747	3690	0437	1898	1290	3188	8645	4980	13625
13	4618	1933	6551	1546	1116	2662	6164	3049	9213
14	4539	1460	5999	1446	960	2406	5985	2420	8405
15	3807	510	4317	1273	942	2215	5080	1452	6532
16	3395	2546	5941	941	810	1751	4336	3356	7692
17	3078	1342	4420	626	506	1132	3704	1848	5552
18	1802	1032	2834	325	386	711	2127	1418	3545
Total	54913	32443	87356	16088	11324	27412	71001	43767	114768

TABLE 2

Percent attendance in Rural and Urban areas by age and sex

	Urban			Rural			Total		
Age	Male	Female	Total	Male	Female	Total	Male	Female	Total
6	96.5	96.6	96.5	96.3	98.3	97.1	96.4	96.9	96.6
7	95.5	95.5	95.5	96.0	98.9	97.3	95.7	96.3	95.9
8	97.4	96.3	97.0	96.6	98.0	97.1	97.2	96.7	97.0
9	96.5	96.2	96.4	93.1	98.4	949	95.6	96.7	96.0
10	95.6	95.6	95.6	97.7	96.4	95.6	95.6	96.1	95.8
11	94.8	93.7	94.4	93.5	97.0	94.9	94.6	94.3	94.5
12	96.8	95.3	96.3	96.2	98.6	97.1	96.7	96.2	96.5
13	98.8	98.3	98.6	98.9	99.7	99.2	98.8	98.8	98.8
14	98.9	96.9	98.4	99.1	99.2	99.1	98.9	98.6	98.6
15	99.2	98.8	99.1	99.0	98.0	99.0	99.1	98.9	99.1
16	98.8	98.7	98.8	98.6	99.8	99.1	98.8	99.0	98.0
17	99.0	98.2	98.8	96.5	99.6	97.9	98.6	98.6	98.6
18	98.5	97.4	98.1	97.8	99.5	98.7	98.4	98.0	98.2
Total	97.2	96.3	96.9	96.9	98.7	97.5	97.1	96.9	97.0

TABLE 3

Size of 10 % Random Sample of School Children in Urban and Rural Areas by Governorate and Sex

	Urban			Rural			Total		
Governorate	Male	Female	Total	Male	Female	Total	Male	Female	Total
Cairo	10580	6742	17322	—	—	—	10580	6742	17322
Alexandria	4852	2856	7708	—	—	—	4852	2856	7708
Bihera	3356	1727	5083	829	120	949	4185	1847	6032
Dommiat	1140	478	1618	671	445	1116	1811	923	2734
Kafr Elshiekh	2195	561	5756	1568	841	2408	2763	1402	5165
Gharbia	4591	3256	7847	21	22	43	4612	3278	7890
Monoufia	2430	2040	4470	1925	419	2344	4355	2459	6814
Dakahlia	5502	1746	7266	390	689	1079	5892	2463	8345
Sharkia	3091	2791	5882	1863	505	2368	4954	3296	8250
Qualoubia	2456	1529	3985	1734	1331	3065	4190	2860	7050
Geiza	3559	2044	5603	553	1106	1659	4112	3150	7262
Fayoum	2650	1802	4362	—	—	—	2560	1802	4362
Beny Suief	1729	1112	2841	839	921	1670	2568	2033	4601
Minia	1941	694	2635	1811	1374	3185	3752	2068	582p
Assuit	2115	1570	3685	984	723	1707	3099	2293	5392
Souhag	2690	1573	4263	1269	499	1768	3959	2072	6031
Kena	1769	1259	3028	1075	750	1825	2844	2009	4853
Asswan	1008	617	1625	826	240	1066	1834	857	2691
Total	57564	34415	91979	16538	9985	26343	73922	44400	118322

TABLE 4

Percentage distribution by age and ses in Urban Areas

Age	Male	Female
6	4.8	3.5
7	5.4	4.5
8	5ó1	3.7
9	5.3	5.3
10	5.1	3.7
11	5.1	3.5
12	7.7	4.2
13	5.3	2.2
14	4.2	1.7
15	4.4	0.6
16	3.9	2.9
17	3.5	1.5
18	2.1	1.2
Total	62.9	37.1

TABLE 4 (b)

Percentage Distribution by Age and Sex in Rural Afeas

Age	Male	Female
6	3.7	2.8
7	5.0	4.3
8	4.9	3.0
9	6.1	3.3
10	5.3	3.2
11	4.3	2.9
12	6.9	4.7
13	5.6	4.1
14	5.3	3.5
15	4.6	3.4
16	3.4	3.0
17	2.3	1.8
18	1.2	1.4
Total	58.6	41.4

The age of the pupile, father's educational status, the number of the living rooms and the number of the family members were also recorded.

Technicians were responsible for clinical examination of the heart and chest, mass X-ray radiography.

Tubercline test, size of tubercle, vaccination ... etc., and other results were recorded in the questionnaire as recommended. The field work of this group was periodically checked and under supervision of technicians with long experience in heart and chest diseases.

The percent attendance for examination in all ages and in both sexes for both urban and rural areas was high with an overall rate of 97%. This represents the thorough calling and follow up system designed for the study.

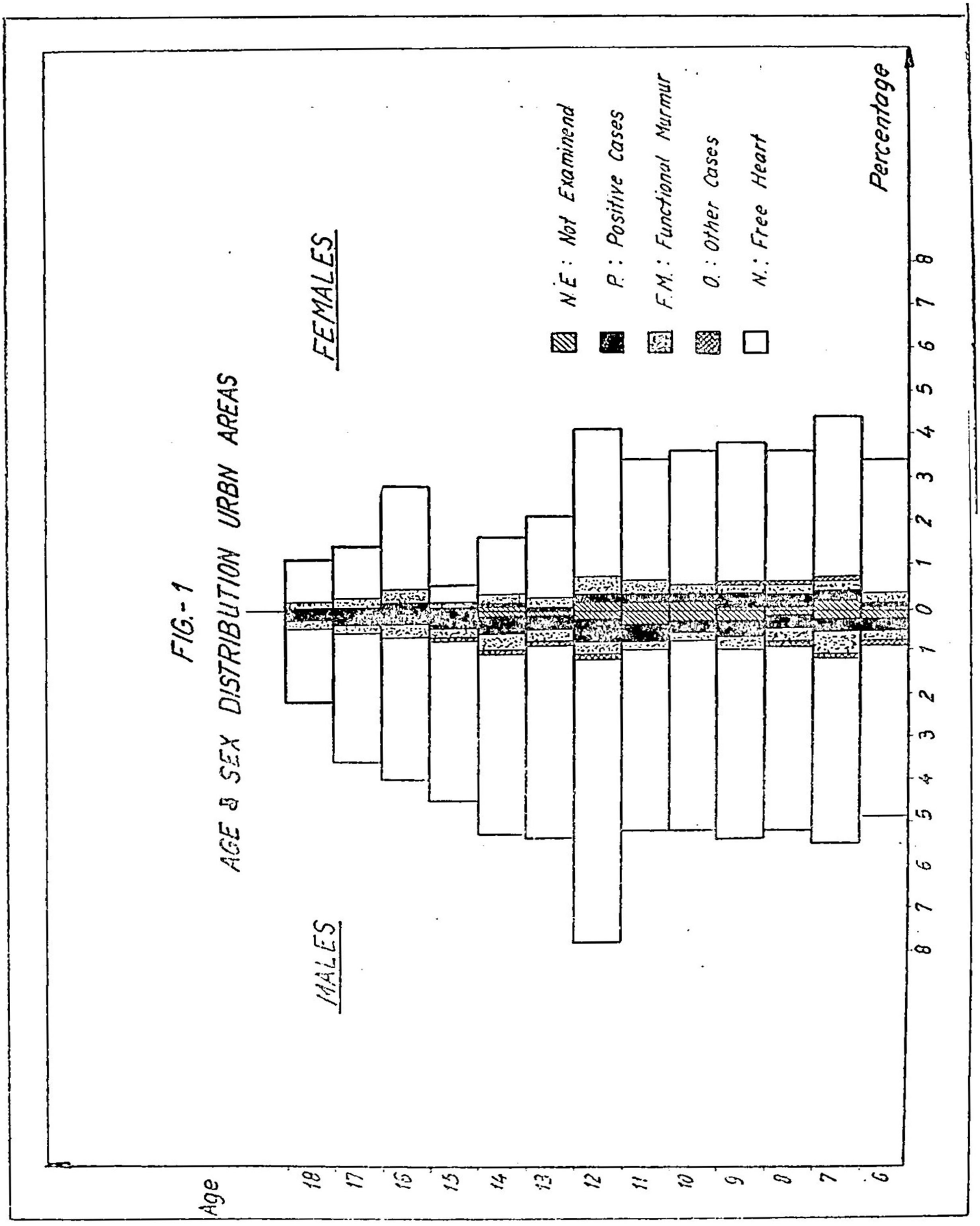


FIG.- 1
AGE & SEX DISTRIBUTION URBN AREAS
FEMALES
MALES
N.E : Not Examinend
P. : Positive Cases
F.M. : Functional Murmur
O. : Other Cases
N. : Free Heart
Age
Percentage
18 17 16 15 14 13 12 11 10 9 8 7 6
8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8

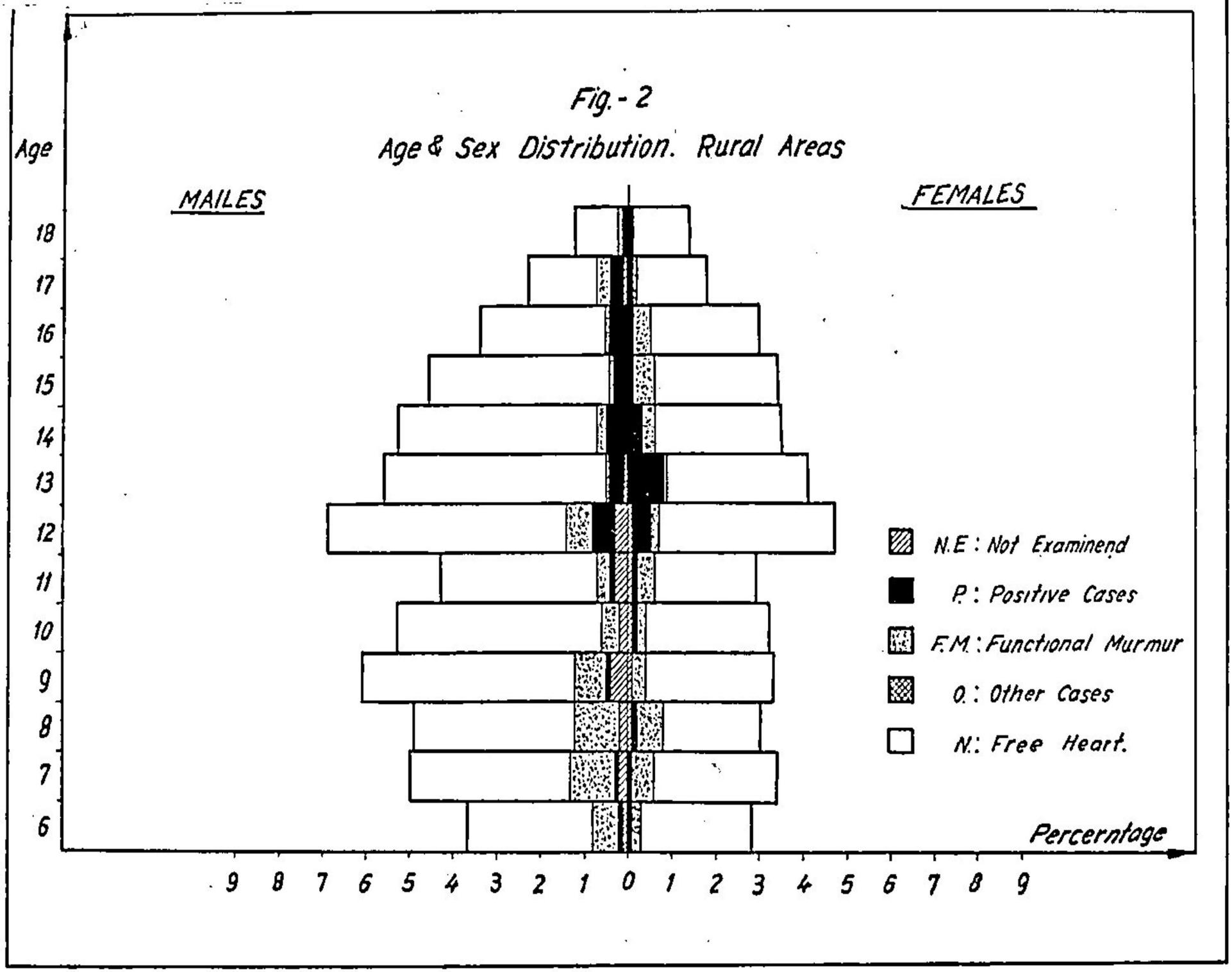


Fig. - 2
Age & Sex Distribution. Rural Areas
Age
MAILES
FEMALES
18
17
16
15
14
13
12
11
10
9
8
7
6
9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9
Percerntage
N.E : Not Examinend
P : Positive Cases
F.M : Functional Murmur
O : Other Cases
N : Free Heart.

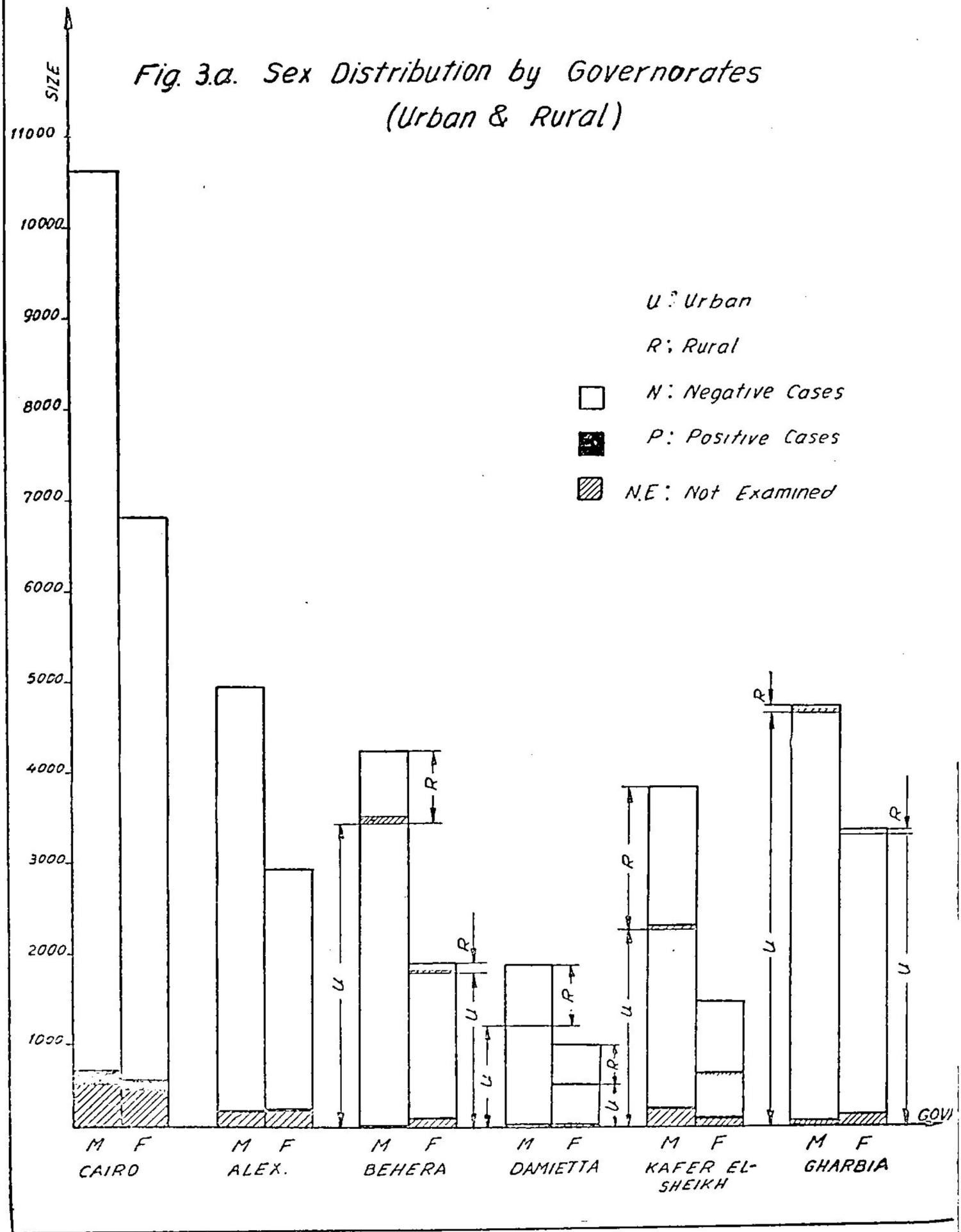


Fig. 3.a. Sex Distribution by Governorates
(Urban & Rural)
SIZE
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
U : Urban
R : Rural
N : Negative Cases
P : Positive Cases
N.E : Not Examined
M F
CAIRO
ALEX.
BEHERA
DAMIETTA
KAFER EL-SHEIKH
GHARBIA
GOVT

Fig. 3. b.: Continued

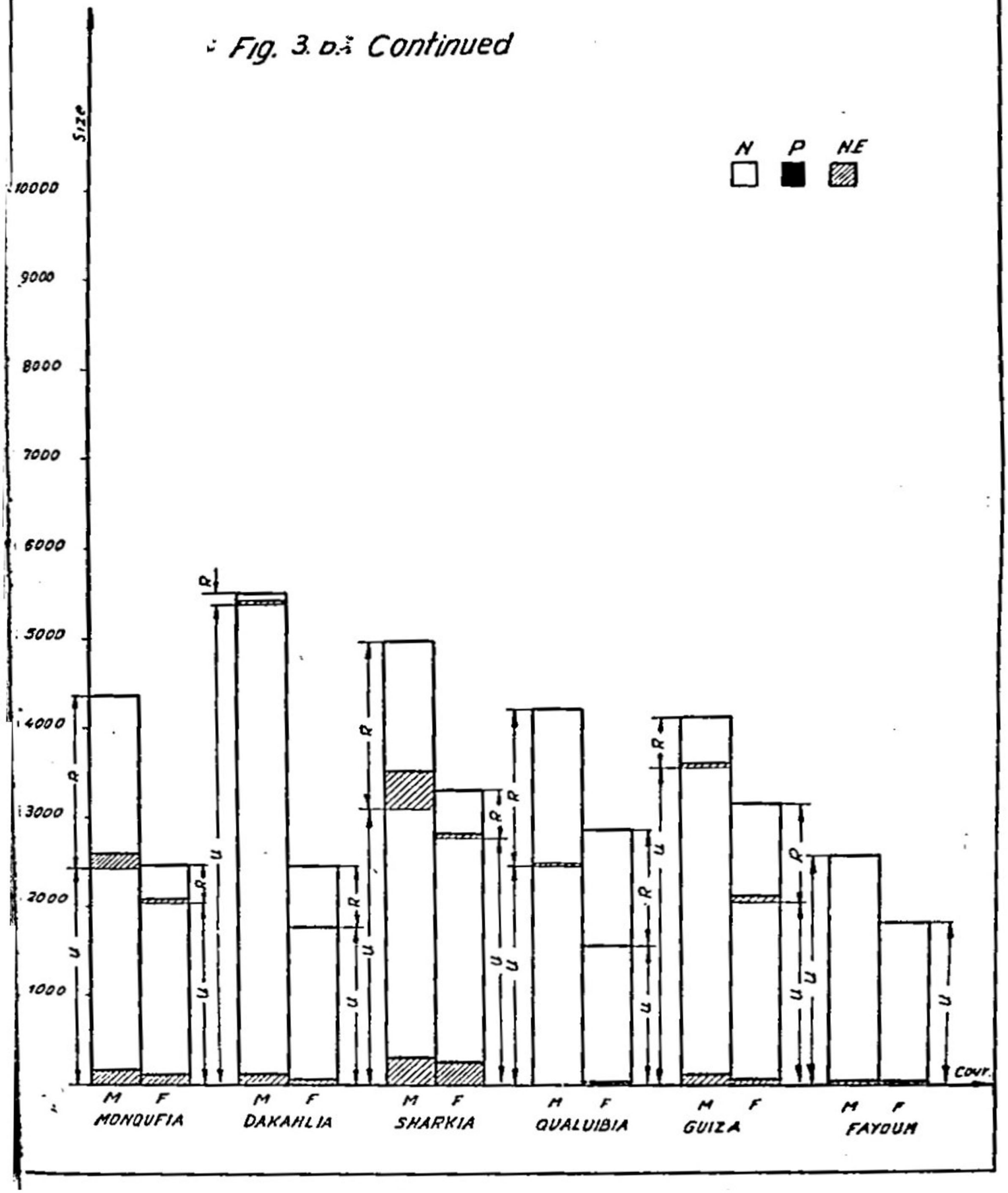
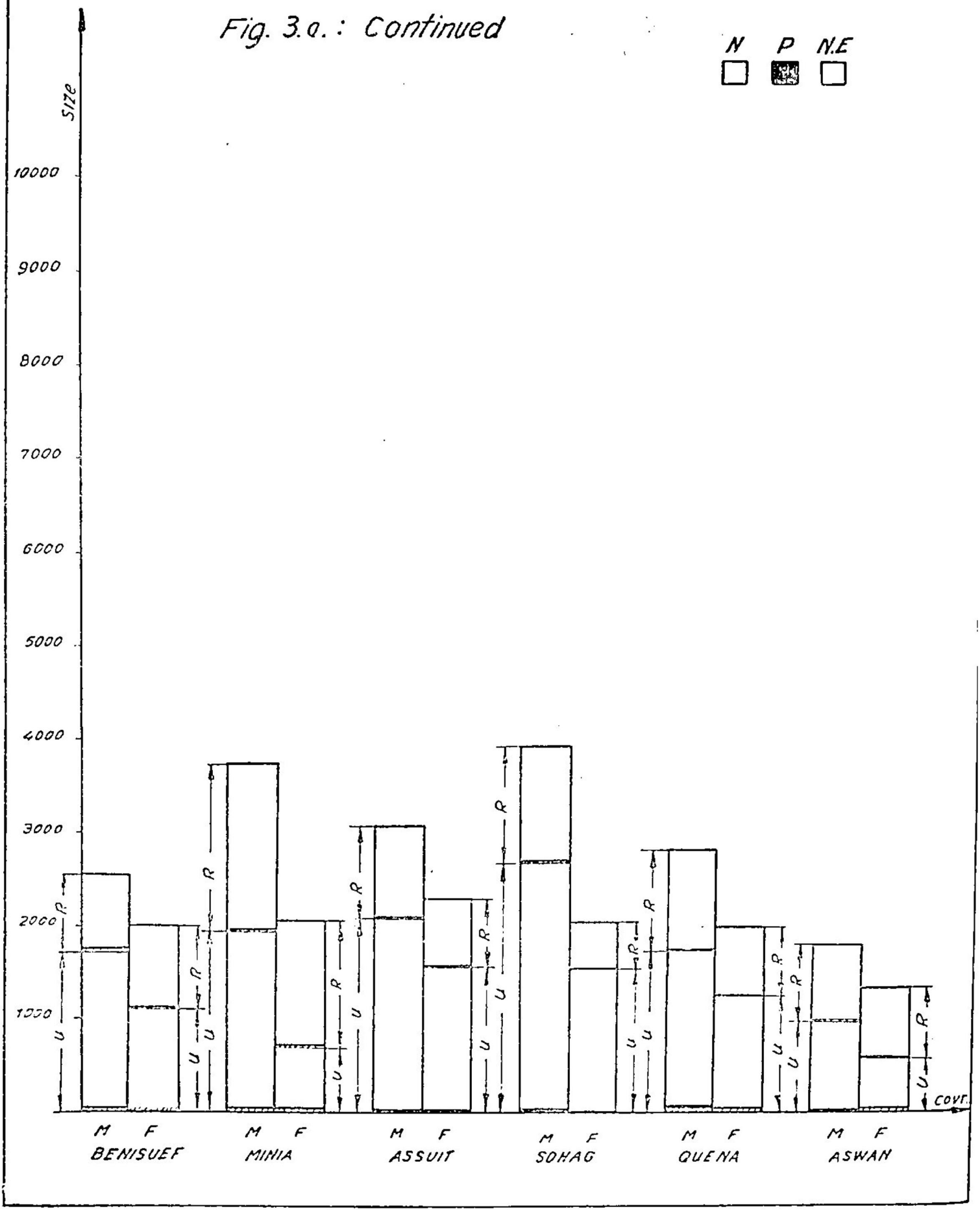


Fig. 3.a.: Continued



The prevalence rate of all forms of heart disease per thousand examined pupils is shown in table (V). A gradual rise with age is observed especially age 11-12,14 and 17-18 a years. These peaks represent the termination of the different grades of educational schools included in the study. The overall rate is 6.4 % for both sexes. The urban to rural rates were compared at school entrance i. e. age of 6 years. An observed difference on the lower side in rural areas is then noticed up to age of 11 years, then the rural rates are closer to urban areas after that age. However, analysis of variance showed no statistical difference of rates between sexes, or between different ages or between rural and urban areas.

TABLE V

Prevelance Rate of Heart Disease for Examined Pupils in Urban and Rural Areas by Age and Sex

	Urban			Rural			Total		
Age	Male	Female	Total	Male	Female	Total	Male	Female	Total
6	5.7	260	4.1	4.1	4.0	4.1	5.4	2.4	4.1
7	6.2	6.1	6.2	2.3	3.4	2.8	5.3	5.5	5.4
8	6.0	7.6	0.7	.8	3.8	1.9	4.8	6.9	5.6
9	6.9	7.6	6.2	2.6	0	1.7	5.8	6.0	5.9
10	5.9	5.2	5.6	0	4.7	1.8	4.4	5.1	4.7
11	7.5	6.3	7.1	3.7	2.6	4.2	6.8	5.6	6.3
12	6.7	6.0	6.5	7.7	9.4	8.4	6.9	6.9	6.9
13	6.1	6.3	6.2	5.9	19.8	1.7	6.1	11.3	6.5
14	8.2	3.5	7.1	9.1	7.4	8.4	8.4	5.1	7.5
15	8.7	7.9	8.6	7.1	4.3	5.9	8.3	5.6	7.7
16	8.3	7.2	7.8	0.8	2.5	6.9	8.9	6.0	7.6
17	7.9	8.3	8.0	13.2	6.2	9.0	8.8	7.7	9.4
18	8.5	10.0	9.0	6.3	10.4	8.5	8.1	10.1	8.9
Total	7.0	6.2	6.7	5.2	6.3	5.7	6.6	6.4	6.4

In table (VI) the percent distribution of mitral rheumatic affection among positive cases is presented. It shows that 78.3% of heart cases were due to rheumatic mitral disease. In urban localities the male percent affection was almost always higher in all ages.

TABLE VI

Distribution of Mitral Rheumatic Affection Among Positive Cases

	Urban			Rural			Total		
Age	Male	Femle	Total	Male	Female	Total	Male	Female	Total
6	60.9	33.3	55.2	00.0	66.7	86.7	66.7	44.4	61.1
7	89.3	73.9	82.4	100.0	100.0	100.0	90.3	77.8	84.5
8	73.1	70.8	72.0	—	100.0	75.0	70.4	74.1	72.2
9	83.9	80.0	82.1	75.0	—	75.0	82.9	80.0	81.7
10	68.0	62.5	65.9	—	100.0	100.0	68.0	70.0	68.9
11	78.1	66.7	74.0	100.0	100.0	100.0	80.6	70.0	76.8
12	79.5	71.4	76.9	42.8	58.3	50.0	70.7	66.7	69.2
13	96.4	58.3	85.0	66.7	86.4	80.6	89.2	76.5	83.0
14	86.5	80.0	85.7	100.0	100.0	100.0	90.0	91.7	90.3
15	91.0	100.0	91.9	66.7	100.0	76.9	85.7	100.0	88.5
16	89.3	50.0	73.9	80.0	100.0	83.3	86.8	55.0	75.9
17	91.7	54.5	80.0	75.0	66.7	72.7	87.5	57.1	78.3
18	80.0	90.0	84.0	100.0	100.0	100.0	82.4	92.9	87.1
Total	82.6	68.3	77.8	75.3	85.7	80.1	81.3	73.0	87.3

In rural areas, the female percent was closer or higher than male percent. In both sexes, a marked rise of the prcent affection is noticed between age of 6 and 7 years especially in females. Another rise is observed at age of 13 years especially among urban males.

In table (VII), the percent distribution of all ages for the different heart diseases is presented.

TABLE VII

Percent Distribution of Heart Diseases Among School Pupils by Sex and Locality

Rheumatic	Urban			Rural		
heart	Total	Males	Females	Total	Males	Females
Mitral	77.8	82.6	68.3	80.1	75.3	85.1
Aortic	2.5	2.7	2.1	2.6	3.7	1.4
Mitral-aorrtic	3.7	4.5	2.1	2.0	3.7	0.0
Congenital	16.1	10.2	27.5	15.2	17.3	12.9
Functional murmurs	6.7	6.1	7.7	10.1	10.1	10.1

The details of these distributions are presented in tables VIII, IX, X and X. The percent distribution observed in these tables denotes clearly that affection of mitral valve is the most prevalent conditions, congenital heart represent only 1/6 of the total cases defected and is highest at age of 6 years (table X) when it is first detected. It drops gradually after that age because it is expected that pupils with congenital heart are going to drop continuation of education because of their limited physical activity.

TABLE VIII

Distributioh of Aortic Rheumatic Affection Among Positive Cases

	Urban			Rural			Total		
Age	Male	Female	Total	Male	Female	Total	Male	Female	Total
6	4.3	—	3.4	—	—	—	3.7	—	2.8
7	—	—	—	—	—	—	—	—	—
8	7.7	4.2	6.0	—	—	—	6.4	3.7	5.6
9	—	—	—	—	—	—	—	—	—
10	—	—	—	—	—	—	—	—	—
11	—	5.6	2.0	—	—	—	—	5.0	1.8
12	6.8	4.8	6.2	6.2	—	3.8	6.9	3.0	5.5
13	—	—	—	—	4.5	3.2	—	2.9	1.4
14	2.7	—	2.4	—	—	—	2.0	—	1.6
15	3.0	—	2.7	—	—	—	2.4	—	2.0
16	3.5	—	2.2	10.0	—	8.3	5.3	—	3.4
17	—	9.1	2.9	12.5	—	9.1	3.1	7.1	4.3
18	6.7	—	4.*b*	—	—	—	5.9	—	3.2
Total	2.7	2.1	2.5	3.7	1.4	2.6	2.9	1.9	2.5

TABLE IX

Distribution of Mitral Aortic Rheumatic Affection Among Positive Cases

	Urgan			Rural			Total		
Age	Male	Female	Total	Male	Female	Total	Male	Female	Total
6	—	—	—	—	—	—	—	—	—
7	—	—	—	—	—	—	—	—	—
8	—	—	—	—	—	—	—	—	—
9	—	—	—	—	—	—	—	—	—
10	4.0	6.3	4.9	—	—	—	4.0	5.0	4.4
11	6.3	—	40.	—	—	—	5.6	—	3.6
12	9.1	—	6.2	7.2	—	3.8	8.6	—	5.5
13	3.6	8.3	5.0	11.1	—	3.2	5.4	2.9	4.2
14	8.1	—	7.1	—	—	—	6.5	—	4.8
15	—	—	—	—	—	—	—	—	—
16	7.1	—	4.3	—	—	—	5.3	—	3.4
17	8.3	9.1	8.6	12.5	—	9.1	9.4	7.1	8.7
18	13.3	10.0	12.0	—	—	—	11.8	7.1	9.7
Total	4.5	2.1	3.7	3.7	—	2.0	4.4	1.5	3.3

TABLE X

Distribution of Congential Affection Among Positive Cases

Age	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Femal	Total
6	34.7	66.7	41.4	—	33.3	14.2	29.6	55.6	36.1
7	10.7	26.1	17.6	—	—	—	9.7	22.2	15.5
8	19.2	25.0	22.0	100.0	—	25.0	22.2	22.2	22.2
10	28.0	31.3	29.3	—	—	—	28.0	5.0	26.7
11	15.6	27.8	20.0	—	—	—	13.9	25.0	17.9
12	4.5	23.8	10.8	42.8	41.7	42.3	13.8	30.3	19.9
13	—	33.3	70.0	22.2	9.1	12.9	5.4	17.6	11.3
14	2.7	20.0	4.8	—	—	—	2	8.3	3.2
15	6.1	—	5.4	33.3	—	23.1	11.9	—	10.0
16	—	50.0	19.7	10.0	—	8.3	2.6	45.0	17.2
17	—	27.3	8.6	—	33.3	9.1	—	28.6	8.7
18	—	—	—	—	—	—	—	—	—
Total	10.2	27.5	16.1	17.3	02.9	15.2	11.4	23.6	15.9

TABLE XI

Distribution of Functional Murmur Affection Among Negative Cases

Age	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
6	5.7	4.4	17.4	8.1	13.4	6.2	6.2	6.2	6.2
7	11.2	5.9	8.8	21.4	21.8	17.8	13.6	7.5	10.7
8	6.7	4.8	5.9	22.2	22.8	22.4	10.3	8.4	9.5
9	6.1	3.4	4.9	13.0	10.3	12.0	7.9	4.8	6.6
10	4.0	6.2	4.9	7.2	5.8	6.7	4.8	6.1	5.4
11	5.2	8.5	6.5	8.3	13.1	10.3	5.9	9.5	7.3
12	4.9	9.7	6.6	9.4	5.6	7.8	5.9	8.6	6.9
13	5.7	1.6	7.5	1.3	1.8	1.5	4.6	8.1	5.8
14	9.0	16.3	0.7	3.5	10.6	6.3	7.7	4.0	9.5
15	5.1	12.0	5.9	3.2	15.1	8.3	4.6	14.0	6.7
16	7.2	10.0	8.4	2.2	13.7	7.5	6.1	10.9	8.2
17	6.0	11.5	7.6	16.8	8.0	12.8	7.7	10.5	8.7
18	4.5	5.0	4.7	9.5	0	4.3	5.3	3.6	4.6
Total	6.1	7.7	6.7	10.1	10.0	10.1	7.0	8.3	7.5

The affection of the aortic valve is observed more with increase of age also in cases of both mitral and aortic valve disease.

The results indicate that mitral valve is affected most earlier than both mitral and aortic valve, and at the same time most common lesion observed.

In table (XI), it is clear that the discovering of functional murmurs is more in rural than urban areas. This is espected because of problems of anaemia and malnutrition producing such murmurs. The prevalence is particularly higher in ages between 6-10 years, where the difference between urban and rural range 2-4 times more in the later. More observed sex differences were observed in urban pupils where female prevalence was greater practically in all ages except 7-9 years.

The distribution of the sampled pupils by governorates is represented in table (III). As noted before, both Cairo and Alexandria governorates are only urban. The number of pupils included in Gharbia governorate in rural areas was very small and should be excluded for comparative purposes with other governorates. The urban sample was more than three times higher than rural with male to female ratio 2 : 1 in both urabn and rural areas.

Table (XII) represents the percentage distribution of detected pupils by governorate. Table (XIII) represents the prevelance rates of all forms of heart disease according to governorates. The results do not show any particular explanable pattern if we consider the conditions in different governorates with regard to environmental temperature, humidity or crowiding conditions or socio-economic levels .. etc. The marked high prevalence rate among Cairo pupils is till unexplanable except may be on basis of a more experienced team and specialists who were able to pick up more cases than in other governorates. The observed prevalence in rural Gharbia should be greatly questioned since it is unlikely to examine 43 pupils and to find 70 % of them affected with heart disease. The zero rate observed in other governorate should not be astonished at, since the numbers examined were less than 1000 or around and a zero rate means not one case was detected.

TABLE XII

Percentages of the Detected Cases Among Pupils by Governorates and Sex

	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Cairo	95.7	93.9	95.0	—	—	—	95.7	93.9	95.0
Alexandria	96.6	93.2	95.3	—	—	—	96.6	93.6	95.3
Bihera	91.7	94.2	92.5	92.0	99.1	92.9	91.7	94.6	92.6
Dommiat	99.8	99.4	99.6	100.0	100.0	100.0	99.9	99.7	99.8
Kafr Elshiekh	91.3	95.6	90.1	98.9	98.9	98.9	94.9	93.6	94.2
Gharbia	99.2	96.6	98.1	95.2	00.0	97.6	99.1	96.1	98.1
Monoufia	94.1	92.5	93.4	96.9	98.0	96.4	94.9	93.5	94.4
Dakahlia	98.7	98.9	98.7	99.7	100.0	99.0	98.7	99.2	98.8
Sharkia	91.2	91.5	91.3	80.0	90.6	82.3	87.0	91.4	88.8
Qualoubia	100.0	99.9	99.9	99.5	99.6	99.6	99.8	99.8	99.8
Geiza	96.7	98.0	97.1	89.2	95.2	93.2	95.6	97.0	96.2
Fayoum	99.1	98.3	98.7	—	—	—	9.19	98.3	98.7
Beny Suief	99.7	99.6	99.6	99.7	99.7	99.7	99.7	99.7	99.7
Minia	99.4	99.4	99.4	99.9	99.8	99.9	99.6	99.7	99.7
Assuit	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Souhag	100.0	100.0	100.0	100.0	100.0	100.0	100.2	100.0	100.0
Kena	96.9	98.0	97.4	100.0	100.0	100.0	98.1	98.8	98.4
Asswan	100.0	99.8	99.9	99.6	99.6	99.6	99.8	99.8	99.8
Total	96.8	95.9	96.4	96.3	98.7	97.2	96.7	96.5	96.6

TABLE XIII

Prevelance Rates of All Forms of heart Diseases

by Governorate According to Age and Sex

Governorate	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Cairo	18.4	14.5	16.9	—	—	—	18.4	14.5	16.9
Alexandria	3.4	4.1	3.4	—	—	—	3.4	4.1	3.7
Bihera	.6	4.3	1.9	0	0	0	.5	3.4	1.6
Dommiat	1.7	0	1.2	1.5	4.5	2.7	1.7	2.2	1.8
Kafr Elshiekh	4.0	2.1	3.6	3.9	12.0	6.7	3.9	8.4	5.1
Gharbia	5.9	5.7	6.8	100.0	45.0	70.0	6.3	6.0	6.2
Monoufia	7.0	2.6	6.0	10.3	4.9	9.3	8.5	3.0	6.5
Dakahlia	8.3	12.6	9.4	12.9	7.3	9.3	8.6	11.1	9.3
Sharkia	5.3	6.2	5.8	7.4	8.7	7.7	6.0	6.6	6.3
Qualoubia	2ô4	2.0	2.3	5.2	2.3	3.9	3.6	2.1	3.0
Geiza	3.8	4.0	3.9	2.0	7.6	5.8	3.6	5.2	4.3
Fayoum	3.9	2.3	3.2	—	—	—	3.9	2.3	3.2
Beny Suief	2.9	0	1.8	1.2	3.3	2.3	2.3	1.5	2.1
Minia	2.6	2.9	2.7	1.7	3.0	2.2	2.1	2.9	2.4
Assuit	2.4	3.8	3.0	4.1	4.1	4.1	3.5	3.9	3.3
Souhag	10.9	5.7	9.0	15.0	2.0	11.3	.6	4.9	9.6
Kena	1.2	4.0	2.4	5.6	5.3	5.5	2.9	4.5	3.0
Asswan	1.0	6.5	3.1	0	0	0	.5	4.7	1.8
Total	7.1	6.5	6.8	5.5	5.1	5.4	6.7	6.1	6.6

Tables XIV, XV, XVI and XVII present the percentage distribution of mitral lesions, aortic lesions, mitral and aortic lesions, congenital lesions among positive cases. Table (XVIII) represents percentage of functinal murmurs among negativ cases. Again no particular observed pattern between governorates could be described. However, in Dakahlia, Sharkia, Kalubia and Geiza governorates, cases with congential heart murmurs were diagnosed, were frequently than rheumatic heart. Thus, the percent of cases with mitral univalvement were less in these governorates than practically all others . Wheather this represents a true observation or a result of bias from working team in these particular governorates it needs more investigation.

TABLE XIV

Distribution of Mitral Rheumatic Affection Among Positive Cases

	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Cairo	93.6	82.6	89.9	—	—	—	93.6	82.6	89.9
Alexandria	62.5	45.5	55.6	—	—	—	62.5	45.5	55.6
Bihera	100.0	71.4	77.8	—	—	—	100.0	71.4	77.8
Dommiat	100.0	—	100.0	0	100.0	66.7	66.7	100.0	80.0
Kafr Elshiekh	62.7	100.0	66.7	83.3	80.0	81.3	71.4	81.8	76.0
Gharbia	81.4	66.7	75.6	100.0	100.0	100.0	82.8	68.4	77.1
Monoufia	87.5	80.0	85.7	57.9	50.0	57.1	71.4	71.4	71.4
Dakahlia	62.2	50.0	58.2	80.0	60.0	70.0	64.0	51.9	59.7
Sharkia	46.7	50.0	48.4	81.8	75.0	80.0	61.5	55.0	55.0
Qualoubia	33.3	0	22.2	66.7	33.3	58.3	53.3	16.7	42.9
Geiza	53.8	12.5	38.1	00.0	75.0	77.8	57.1	43.8	50.0
Fayoum	90.0	75.0	85.7	—	—	—	90.0	75.0	85.7
Beny Suief	100.0	—	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Minia	100.0	100.0	100.0	33.3	33.3	100.0	75.0	100.0	85.7
Assuit	80.0	100.0	90.1	75.0	66.7	71.4	87.8	88.9	83.3
Souhag	93.1	77.8	89.5	100.0	100.0	100.0	95.8	80.0	92.1
Kena	100.0	80.0	85.7	83.3	100.0	90.0	87.5	88.9	88.2
Asswan	0	75.0	60.0	—	—	—	0	75.0	60.0
Total	82.7	69.5	78.1	77.0	78.0	77.3	81.3	71.9	77.9

Analysis of variance of the percent distribution between governorates, between urban and rural localities, showed no observed statistical difference, but there is a difference between the urban localities within the governorates.

It was found that the difference betwen the urban areas, the governorate were significant (level 0.05), while they were not significant between the two sexes.

TABLE XV

Distribution of Aortic Rheumatic Affection among positive cases

Governorate	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Cairo	2.7	2.2	2.5	—	—	—	2.7	2.2	2.5
Alexandria	6.3	0	3.7	—	—	—	6.3	0	3.7
Bihera	0	0	0	—	—	—	0	0	0
Dommiat	0	—	0	0	0	0	0	0	0
Kafr Elshiekh	12.5	0	11.1	0	0	0	7.1	0	4.0
Gharbia	3.7	11.1	6.6	0	0	0	3.4	10.5	6.3
Monoufia	6.3	0	4.8	0	0	0	2.9	0	2.4
Dakahlia	2.2	0	14.9	20.0	0	10.0	4.0	0	2.6
Sharkia	0	0	0	9.1	0	3.8	3.8	0	2.2
Qualoubia	16.7	0	11.1	0	0	8.3	13.3	0	9.5
Geiza	7.7	0	4.8	0	0	0	0	0	3.3
Fayoum	0	0	0	—	—	—	0	0	0
Beny Suief	0	0	0	0	0	0	0	0	0
Minia	0	0	0	0	0	0	0	0	0
Aussuit	0	0	0	0	0	0	0	0	0
Souhag	0	11.1	2.6	0	0	0	0	10.0	1.7
Kena	0	0	0	0	0	0	0	0	0
Asswan	0	0	0	—	—	—	0	0	0
Total	3.1	2.3	2.8	3.4	0	2.2	3.1	1.9	2.7

TABLE XVI

Distribution of Mitral Aortic Rheumatic Affection among positive cases

Governorate	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Cairo	1.1	2.2	1.4	—	—	—	1.1	2.2	1.4
Alexandria	25.0	0	1.8	—	—	—	25.0	0	14.8
Bihera	0	14.3	11.1	—	—	—	0	14.3	11.1
Dommiat	0	—	0	0	0	0	0	0	0
Kafr Elshiekh	12.5	0	11.1	0	0	0	7.1	0	4.0
Gharbia	7.4	0	4.4.	0	0	0	0	0	4.2
Monoufia	0	0	0	0	0	0	0	0	0
Dakahlia	4.4	0	3.0	0	0	0	4.0	0	2.6
Sharkia	0	0	0	9.1	25.0	13.3	3.8	5.0	4.3
Qualoubia	16.7	0	11.1	11.1	0	8.3	13.3	0	9.5
Geiza	15.4	12.5	14.3	0	0	0	14.3	6.3	10.0
Fayoum	10.0	0	7.1	—	—		10.0	0	7.1
Beny Suief	0	—	0	0	0	0	0	0	0
Minia	0	0	0	33.3	0	14.3	12.5	0	7.1
Assuit	20.0	0	9.1	0	0	0	0	0	5.6
Souhag	0	0	0	0	0	0	0	0	0
Kena	0	20.0	14.2	0	0	0	0	11.1	5.9
Asswan	100.0	0	20.0	—	—	—	100.0	0	20.0
Total	4.3	2.3	3.6	3.4	2.0	2.9	4.1	2.3	3.5

TABLE XVII

Governorate	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Cairo	2.7	13.0	6.1	—	—	—	2.7	13.0	6.1
Alexandria	6.3	54.5	25.9	—	—	—	6.3	54.5	25.9
Bihera	0	14.3	11.1	—	—	—	0	14.3	11.1
Dommiat	0	—	0	—					
Kafr Elshiekh	12.5	0	11.1	16.7	20.0	18.8	14.3	18.2	16.0
Gharbia	7.4	22.2	13.3	0	0	0	6.9	21.1	12.5
Monoufia	6.3	20.0	9.5	42.1	50.0	42.3	25.7	28.5	26.1
Dakahlia	31.1	50.0	37.3	0	40.0	20.0	28.0	48.1	35.1
Sharkia	53.3	50.0	51.6	0	0	0	30.8	40.0	34.8
Qualoubia									
Geiza	23.1	75.0	42.9	0	25.0	22.2	21.4	50.0	36.7
Fayoum	0	25.0	7.1	—	—	—	0	25.0	7.1
Beny Suief	0	0	0	0	0	0	0	0	0.1
Minia	0	0	0	33.3	0	14.2	0	0	7
Assuit	0	0	0	25.0	33.3	28.4	11.1	11.1	11.1
Souhag	6.9	11.1	7.9	0	0	0	4.2	10.0	5.2
Kena	0	0	0	16.6	0	10.0	12.5	0	5.6
Asswan	0	25.0	20.0	—	—	—	0	25.0	20.0
Total	9.9	25.8	15.5	16.1	20.0	17.5	11.4	24.7	15.9

TABLE XVIII

Percentage of Functional Murmurs Among Negative Cases

	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Femal	Total
Cairo	11.3	15..	12.9	—	—	—	11.3	15.2	12.9
Alexandria	22.0	23.8	22.7	—	—	—	22.0	23.8	22.7
Bihera	0	.6	.2	1.3	0	1.1	.3	.2	.4
Dommiat	1.8	4.2	2.5	0	2.3	.9	1.1	3.3	1.8
Kafr Elshiekh	.5	0	.4	68.7	53.5	63.4	30.2	33.8	31.8
Gharbia	4.2	6.1	5.0	0	0	0	4.2	6.0	4.9
Monoufia	7.9	4.2	6.3	14.2	26.8	16.5	10.7	8.2	9.9
Dakahlia	4.8	5.2	4.9	18.2	1.5	6.5	5.7	4.2	5.3
Sharkia	4.6	1.2	3.0	7.4	4.4	6.7	5.6	1.7	3.9
Qualoubia	2.4	1.3	2.0	.6	0	.3	7.7	.7	1.3
Geiza	5.8	9.5	7.2	4.0	1.9	2.9	5.6	7.9	6.2
Fayoum	.4	1.1	.7	—	—	—	.4	1.1	.7
Beny Suief	2.3	13.5	6.7	9.6	3.3	6.3	4.7	8.9	6.6
Minia	2.6	4.3	4.1	1.1	0	.6	1.9	1.5	1.7
Assuit	.5	0	.3	1.0	0	.6	.6	0	.4
Souhag	.4	0	.2	0	2.0	.6	.3	.5	.3
Kena	1.2	0	.7	0	0	0	.7	0	.4
Asswan	0	1.6	.6	0	0	0	0	1.2	.4
Total	6.3	7.4	6.6	10.5	6.6	9.0	7.1	7.2	7.1

In order to group these governorates according to the density of the disease the rates were arranged in a descending order and the least significant difference was computed. It was 2.58 and 2.90 at 0.05, and 0.01 level of significant respectively. Thus, the urban area was divided into the following three levels :

1. *High level* : Includes the urban cities of Cairo, Dakahlia and Souhag.

2. *Moderate level* : Includes the urban citis of Gharbia, Sharkia and Monoufia.

3. *Low level* : Includes the other urban cities of the Country.

As for rural areas table (XII) shows that the rate of incidenence ranged from 100 % for Gharbia males to zero rate perthousand for Bihera and Aswan rural males, while for females the highest rate was 12% for Kafr El Sheikh to zero per thousand for Bihera and Aswan females, «F» test was used to test the significance of these rates after beig transformed.

It was found that the difference were not significant either between the governorates or the two sexes.

Summary

A sample of 118, 322 school pupils between age of 6-18 years was examinedt for existence of heart diseases, distributed between uraban and rural areas as well over all governorates in U. A. R. A total of 6.6 per thousand rate of heart disease prevalence was noticed. Rheumatic mitral, valve affection represented almost 80 % of the cases, congenital heart 16% and 4% other lesions. Functional murmurs were of 7 per thousand rate among examined pupils. No observed statistical differences were noticed between ages, sexes, urban and rural or between governorates.

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