1	OPHTHALMIC PROBLEMS OF ADULTS IN RURAL COMMUNITIES OF
2	RIVERS STATE, NIGERIA
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5	ABSTRCT
6	Aim: To determine the ophthalmic problems and their possible causes among adults in rural
7	communities in Rivers State.
8	Methods: A multistage population based random sampling study of adults in five clans of
9	Etche Local Government Area of Rivers State. Medical history was taken and comprehensive
10	ocular examination done on each subject.Ocular examination included visual acuity, visual field,
11	tonometry and ophthalmoscopy. Data taken were recorded and analysed using statistical software
12	called Minitab 11. Ethical approval was obtained from relevant authorities.
13	Results: Out of the 600 subjects seen in this study 276 (46.0%) were males and 324 (54.0%)
14	females. They were all above 21 years old. Twenty six (2.4%) subjects had good vision while 8
15	(0.8%) were blind. The ophthalmic problems identified werePresbyopia 298 (28.0%), Refractive
16	error 247 (23.2%), Cataract 126 (11.8%), Allergic conjunctivitis 106 (9.9%), Glaucoma 94
17	(8.8%), Pterygium 86 (8.1%), Bacterial conjunctivitis 35 (3.3%), Corneal opacity 32 (3.0%),
18	Chalazion 4 (0.4%), Diabetic retinopathy 3 (0.3%) and Ptosis 1 (0.1%).
19	Conclusion: The most common ophthalmic problems in this study which were dependent on
20	gender and occupation include Presbyopia, Refractive Error, Cataract and Allergic
21	Conjunctivitis. More females and farmers were seen in this study. The problems identified can be
22	easily managed if well-equipped health facilities are provided by the government.
23	Keywords: Ophthalmic problems, adults, rural communities, Rivers State.

25 INTRODUCTION

Ophthalmic problems are global and constitute serious public health challenges especially among older adults¹. According to Bethesda, the prevalence of blindness and visual impairment increases with age among all racial and ethnic groups, especially among people older than 75years of age².

29 The World Health Organization estimated number of people with visual impairment worldwide is 285million, while 39 million are blind and 246 have low vision³. About 81% of all people who are blind or 30 have moderate to severe visual impairment are aged 50 years and above, indicating that with an 31 increasing population of older people, more people will be at risk of visual impairment due to chronic eye 32 33 diseases⁴. About 90% of the world's visually impaired live in low income settings and 80% of all visual impairment can be prevented or curedand over 90% of the world blindare in Sub Saharan African and 34 Asia and especially among the persons in the rural communities⁵. Lawallen and Courtright reported the 35 major causes of blindness in Africa as cataract, trachoma and glaucoma⁶Blindness prevalence rates vary 36 37 globally but evidence based study suggests that approximately 1% of Africans are blind and majority of the blindness in that region are preventable or curable⁶. 38

The Nigeria National blindness and visual impairment survey that was carried out in the year 2009⁷showed that the major causes of blindness and visual impairment among adults in Nigeria were uncorrected refractive error, cataract and glaucoma. The survey also stated that increasing age was associated with increasing prevalence of all blinding conditions. According to the survey, 4.25 million adults aged 40 years and above have moderate to severe visual impairment or blindness. The prevalence of blindness in Nigeria is 0.78% attributed thatto poor technology, minimal eye care services, malnutrition and ^{poverty7,8}.

The commonest causes of blindness worldwide are cataract, glaucoma,trachoma, onchocerciasis and refractive errors⁹. Most of these blinding diseases are preventable and easily treatable but the majority of the victims in Africa and Asia are either poor, ignorant, or do not have eye -care services available to them¹⁰. Etche indigenes are predominantly farmers and farmers according to Momoh and Abadom are usually exposed to certain occupational hazards that predispose them to ocular diseases and injuries¹¹.
Visual impairment obviously compromises people's quality of life because it makes them unable to read,
watch television, drive a car, operate machines or attend to themselves. Most times, it isolates older
people from friends and family which may lead to depression.

Ejimadu and Pedro-Egbe¹² in their study on prevalence and causes of Blindness in Ikwerre Local 54 Government Area of Rivers State revealed that the common causes of blindness in that community which 55 were avoidable included Cataract, Glaucoma, Optic Atrophy, Corneal Opacity, Phthisis Bulbi, Absent 56 57 Globe, Chorioretinitis and Maculopathy. They recommended that more emphasis on eye care should focus on prevention through public enlightenment and regular eye screening with participation of the 58 government. They were also the prohibition of harmful traditional practices, discouragement of self-59 medication, provision of basic eye care delivery and increasing cataract surgery will reduce prevalence of 60 61 blindness.

62 Our study seeks to determine the ophthalmic problems and their possible causes among adults in rural

63 communities in Rivers State

- 65
- 66 **METHODOLOGY**
- A multistage population based random sampling study of adults in five clans of Etche Local GovernmentArea of Rivers State.
- 69 Medical history was recorded and comprehensive ocular examination done on each subject who was at
- 70 least 21 years after obtaining consent from them.
- 71 Instruments used during the research were Pen torch for examination of the external structures of the
- 72 eyes, Keeler ophthalmoscopes for fundus examination, Snellen's charts both literate or illiterate charts for
- 73 visual acuity assessment, Reichert AT 555 Auto non-contact tonometer for measurement of the intra-
- 74 ocular pressure and trial lens cases used for subjective refraction.
- 75 Data taken were analysed using statistical software called Minitab 11 where the raw data obtained were
- 76 classified into different groups and categories based on their common characteristics. The data were

- logically represented, where raw data were summarized and displayed in a compact form that is statistical 77 78 tables.
- 79 An ethical approval to carry out the study was obtained from Rivers State Ministry of Health through the
- office of Planning, Research and Statistics. Afterwards a second approval was obtained from Rivers State 80
- Ethical Committee following due applications. 81
- 82 Inclusion criteria was adults in Etche local Government Area who were 21 years and above and was
- randomly selected at the sampling stage. It also involved those that signed the consent forms and were 83 84 ready to participate.
- 85

86 RESULT

- 87 Table 1 shows the demographical characteristics of the respondents. Out of the 600 subjects seen in this study 276
- 88 (46.0%) were males and 324 (54.0%) were females. Their ages ranged from 21 years and above. The highest age
- 89 group was 41-50 with 174 (29.0%) subjects, followed by age group of 31-40 years 161 (26.8%) while the smallest
- 90 age group was >60 years with frequency of 38 (6.3%).
- 91 The second segment of the table shows the occupational distribution of the subjects. Majority were farmers; 276
- (46.0%) while others were civil servants 152 (25.3%), and traders 102 (17.0%), few students 46 (7.6%), Retirees 15 92
- 93 (2.5%) and unemployed 9 (1.5%).

Table 1: DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS 94

95	AGE (YEARS)	MALE (%)	FEMALE (%)	FREQUENCY (%)	
96	21-30	57 (9.5)	60 (10.0)	117 (19.5)	
97	31-40	79 (13.1)	82 (13.6)161 (26.8))	
98	41-50	72 (12.0)102 (17	7.0) 174 (29	9.0)	
99	51-60	46 (7.6)	64 (10.6)	110 (18.3)	
100	>60	22 (3.6)	16 (2.6)	38 (6.3)	
101	TOTAL	276 (46.0)324 (5	4.0) 600 (2	100)	
102	OCCUPATION				
103	Civil Servants	81 (13.5)	71 (11.8)	152 (25.3)	

104	Traders	52 (8.6)	50 (8.3)	102(17.0)	
105	Farmers	115 (19.1)	161(26.8)	276(46.0)	
106	Students	17 (2.8)	29(4.8)	46 (7.6)	
107	Retirees	9 (1.5)	6(1.0)	15(2.5)	
108	Unemployed	2 (0.3)7(1.1)	9(1.5)		
109	TOTAL	276 (46.0)	324(54.0)	600(100)	-
110					

111 Table 2 summarizes the distribution of ophthalmic conditions of subjects. The most predominant oculo-visual

- 112 condition was presbyopia (28.0%), followed by refractive error (23.1%) and cataract (11.8%). The leastcommon
- 113 conditionswere chalazion (0.4%), diabetic retinopathy (0.3%) and ptosis (0.1%).

114 TABLE 2: DISTRIBUTION OF OPTHALMIC CONDITIONS OF SUBJECTS.

115	OCULO/VISUAL STATUS	FREQUENCY (N)	(%)
116	Presbyopia	298	28.0
117	Refractive Error	247	23.1
118	Cataract	126	11.8
119	Allergic Conjunctivitis	106	9.9
120	Glaucoma	94	8.8
121	Pterygium	86	8.0
122	Bacterial Conjunctivitis	35	3.3
123	Corneal Opacity	32	3.0
124	Good Vision	26	2.4
125	Blindness	8	0.8
126	Chalazion	4	0.4
127	Diabetic Retinopathy	3	0.3
128	Ptosis	1	0.1

129 Total 1066

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131 Table 3 shows the distribution of common ophthalmic problems with respect to occupation. Farmers (41.3%)

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132 presented more with cataract than other occupations. Civil Servants had more errors refractive (51.8%) than other

133 groups. The highest prevalence of presbyopia occurred amongst Civil Servants (49.0%).

134 Table 3: DISTRIBUTION OF COMMON OPTHALMIC PROBLEMS WITH RESPECT TO

135 OCCUPATION.

OCCUPATION OCULO-VISUAL CONDITIONS (NO (%))

C	ATARACT REF ERF	RACTIVE PRESBY	YOPIA ALLERGIC CONJUNC	PTERYG IIVITIS	IUM
CIVIL SERVANT	19 (15.1%)	128(51.8%)	146(49.0%)	15(14.2%)	10(11.6%)
TRADERS	45 (35.7%)	22(8.9%)	50(16.8%)	18(17.0%)	16(18.6%)
FARMERS	52 (41.3%)	57 (23.1%)	69(23.2%)	55(51.9%)	53(61.6%)
STUDENTS	0 (0%)	31(12.6%)	10(3.3%)	12(11.3%)	3(3.5%)
RETIREES	8 (6.3%)	6(2.4%)	15(5.0%)	3(2.8%)	3(3.5%)
UNEMPLOYED	2 (1.6%)	3(1.2%)	8(2.7%)	3(2.8%)	1(1.2%)
TOTAL	126(100%)	247 (100%)	298(100%)	106(100%)	86(100%)

136 Table 4 shows gender related ocular conditions seen in thesubjects. Females presented more with allergic

137 conjunctivitis (7.1%), pterygium (4.1%) and cataract (6.0%) than males. While the male presented more with

- 138 refractive error (11.9%) and presbyopia (14.8%) than females.
- 139

140 Table 4: GENDER –RELATED OHTHALMIC CONDITIONS IN SUBJECTS

141	Ocular conditions	Gender 1	No (%) Prevalence		
142		Male	Female	Total	
143	Presbyopia	158 (14.8%)	140 (13.1%)	298 (28.0%)	
144	Refractive error	127 (11.9%)	120 (11.3%)	247 (23.1%)	
145	Cataract	62 (5.8%)	64 (6.0%)	126 (11.8%)	
146	Allergic	30 (2.8%)	76 (7.1%)	106 (9.9%)	
147	Conjunctivitis				
148	Glaucoma	46 (4.3%)	48 (4.5%)	94 (8.8%)	
149	Pterygium	42 (3.9%)	44 (4.1%)	86 (8.0%)	
150	Bacterial	17 (1.6 %)	18 (1.7%)	35 (3.3%)	
151	Conjunctivitis		K i		
152	Corneal Opacity	21 (2.0%)	11 (1.0%)	32 (3.0%)	
153	Good Vision	14 (1.3%)	12 (1.1 %)	26 (2.4%)	
154	Blindness	5 (0.5%)	3 (0.3%)	8 (0.8%)	
155	Chalazion 3 (0.3%)) 1 (0.	.1%) 4 (0	.4 %)	
156	Diabetic	3 (0.3%)	0 (0%)	3 (0.3%)	
157	Retinopathy				
158	Ptosis	0 (0%)	1 (0.1%)	1 (0.1%)	
	Total	528 (49.5%)	538 (50.5%)	1066 (100%)	

160 **DISCUSSION**

The ophthalmic problems found among adults in Etche LGA werePresbyobia 298 (28.0%). Refractive 161 162 Error 247 (23.1%), Cataract 126 (11.8%), Allergic Conjunctivitis 106 (9.9%), Glaucoma 94 (8.8%), 163 Pterygium 86 (8.1%), Bacterial Conjunctivitis 35 (3.3%), Corneal Opacity 3 (3.0), Chalazion 4 (0.4%), Diabetic Retinopathy 3 (0.3%) and Ptosis 1 (0.1%). Twenty six (2.4%) subjects had good vision whileB8 164 (0.8%) were blind. These findings are similar to studies by WHO⁴ that listed the common ocular diseases 165 166 worldwide as cataract, glaucoma, conjunctivitis, corneal ulcers, uveitis, refractive errors, pterygium, trachoma, onchocerciasis, xerophthalmia and ocular malignancies. This is also similar to the study by 167 168 Edema and Okojiein a rural area in Ethiopia and Benin City were conjunctivitis, cataract, presbyopia, refractive errors, glaucoma and blepharitis¹³. 169

Presbyopia was the most common type of ophthalmic problems found in our study, accounting for 28.0%
of all cases seen. This is similar to findings by Nwosu¹⁴

. The second most prevalent ophthalmic problem is Refractive Error 247(23.1%). According to WHO,⁴ 172 173 uncorrected refractive errors are the most common cause of visual impairment accounting for 43% of cases and representing an important causes of blindness¹⁵. The prevalence of refractive errors in this 174 study was higher in males than females which may be linked to the fact that majority of the males are 175 176 educated, in school or are civil servants which may be a contributory factor to the diagnosis of refractive error or presbyopia. This was in agreement with a study which stated that the prevalence of refractive 177 178 errors vary with race, age, gender and geographical region and that environmental factors like level of education, occupation, near work load, time of outdoors as a child are also associated with aetiology of 179 refractive error¹⁶. Uncorrected refractive error was the main cause of Low vision and second commonest 180 181 cause of blindness in a study which also revealed that uncorrected refractive error can hamper performance at school, reduce employability and productivity, and generally impair quality of life¹⁵. 182

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Uncorrected refractive error which was the commonest cause of ophthalmic problems in this study has
been reported as the commonest cause of ocular morbidity in another study¹⁷. It was the commonest cause

of mild and moderate visual impairment in the Nigerian national blindness and visual impairment survey
 accounting for 77.9% and 57.1% respectively^{7,18}.

We recorded cataract as the third most common type of ophthalmic problem accounting for 11.8% of all cases which is similar to that of 16.7% reported from a study in Benin, Nigeria¹³. In a study on causes of visual impairment and blindness in Kwara State of Nigeria¹⁹, Cataract was responsible for more than half the cases of ocular morbidity and was the commonest cause of visual disability. The high rate of cataract cases in the study is basically unknown but may be attributed to their constant exposure to ultraviolet rays, firewood smoke, trauma, age group of the study area and poorly controlled diabetes since a lot of the cataract patients reported to be diabetic.

195 The fourth commonest ocular problem reported in this study was Allergic Conjunctivitis with an 196 incidence of 9.9%. This is similar to other studies that reported Allergic Conjunctivitis as the third 197 leading cause of ocular morbidity with prevalence of less than 20%^{14,20}.

The high occurrence of allergic conjunctivitis in this study may be associated with higher pollen content of the farming environment since they are basically farmers, this is related to a study by Momoh and Abadon¹¹ where high rate of allergic conjunctivitis found in farming environment was linked to higher pollen content of farming environment and also they postulated that allergic conjunctivitis may be prevalent in a dusty environment.

Glaucoma is one of the common ocular diseases found in this study accounting for 8.8%. This is similar to a study where Glaucoma was seen in 11.9% of patients¹⁷ and it has been reported to be the second most common cause of blindness or visual impairment worldwide⁵. It is the leading cause of irreversible blindness in West Africa and it has been estimated that 20% of people older than age 40 in West Africa may be at risk from the disease¹⁷. Pterygium is another prevalent ocular disease in this population with an incidence of 8.1%. This is consistent with Momoh and Abadom¹¹ where incidence of pterygium was common among farmers but in constrast in another study²⁰ that showed Pterygium as the second common eye disorder among the welders in their study with a prevalence of 17.5

Corneal Opacity accounted for 3.0% in this study. This may be attributed to the fact that the majority of 212 the subjects are predominantly farmers and most of the subjects reported applying traditional medicine in 213 214 the eyes. Majority of the corneal opacity occurred as a result of trauma and traditional medical practices. About 321(68.0%) respondents have never have any form of ocular trauma while 151(32.0%) respondents 215 reported of having at least one episode of ocular trauma but only 32(3.0%) subjects had corneal Opacity, 216 217 this may have connection with the majority indigene of the study area being predominately farmers. This 218 is in line with the global estimates that showed that there are about total of 1.6 million ocular trauma cases 219 of blindness and about 2.3 million ocular trauma from agricultural labour, also victims have less access to eye care services than their urban counterparts, it is likely that rural people may have a greater burden of 220 vision impairment or blindness caused by trauma¹⁴. 221

In contrast with those of Wokoma and Ichenwo¹⁰ in rural community in Rivers State, Nigeria where a lower occurrence of corneal opacities was reported (0.9%). The subjects being basically farmers had a high occurrence of trauma-related visual problems (corneal opacity) which may be attributed to the fact that they came directly in contact with occupational hazards such as dust, projectiles of organic agricultural materials such as twigs and seeds and falling objects.

Surprisingly bacterial conjunctivitis (3.3%) showed to be an uncommon ocular problem in this study.
This is similar to the study by Momoh and Abadom¹¹ with incidence of 1.3%. Other rare ocular
diseasesfound in this study include chalazion 0.4%, diabetic retinopathy 0.3%, ptosis 0.1% and blindness
0.8%.

The distribution of blindness in this study showed that six subjects (75.0%) had mono-ocular blindness while two subjects (25.0%) were bilaterally blind. The three causes of blindness in the subjects were Glaucoma (25%), Cataract (50%) and Corneal Opacity / Trauma (25%). The incidence of blindness (0.8%) may suggest poor or no availability of eye care services in the locality.

235 This study revealed significant relationship between the subjects' occupations and their common oculovisual problems. The majority of the subjects were mainly farmers 276 (46.0%), civil servants 236 237 152(25.3%) and traders 102 (17.0%). Civil Servants 128 (51.8%) and Students 31(12.6%) have the highest prevalence on Refractive error/Presbyopia respectively. This may be attributed to their visual task 238 being higher than those in other occupation. This is similar to a study by Njepuome, Onyebuchi, and 239 Igbe²¹ that showed the pattern of oculo-visual problems among public / civil servants in Abuja as follows 240 241 refractive error 88.7%, Cataract 1.1%, Pterygium 2.3%, Disc cupping 3.4%, Chalazion 1.1% and 242 Conjunctivitis 3.4% where the ages of the subjects ranged from 25 years to 60 years and the study showed 243 refractive error as a leading cause of visual impairment among civil servants in Abuja.Farmers were found to have the highest prevalence of Allergic Conjunctivitis (51.9%) and Pterygium (61.6%). This 244 245 may also be attributed to the nature of their occupation that is basically outdoor activities that expose them to dust and ultra violet rays. 246

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More so, the common ocular diseases prevalent among adults in our study are dependent on gender. The 248 249 adult females have the highest prevalence on Cataract 64 (50.8%), Allergic Conjunctivitis 76 (71.7%) and ptervgium 44 (51.2%) while Refractive Error 127 (51.4%) /Presbyopia 158 (53.0%) are more prevalent in 250 251 males. This may be associated to the fact that majority of their females are more exposed to farm related 252 activities while the males mostly do official works hence, have higher near visual tasks. This is in contrast 253 to similar studies in the same environment and in southern Nigeria where there were a higher proportion 254 of males to females and the male had a higher prevalence of Pterygium and allergic conjunctivitis in the study byEdema and Okojie¹³. But this finding is similar to a study by Nwosu¹⁴ on rural young adults in 255

Anambra state whose predominant occupation was farming, in which there were more females than males in the study and they had higher prevalence of allergic conjunctivitis than males. Nwosu (1998) postulated that it was probably due to the rural- urban drift of more males than females. It is also similar to a study by Wokoma¹⁰ in a rural community in Rivers State where the proportion of female participants was higher than that of male and they also presented with higher rate of allergic conjunctivitis.

261 The absence of any form of eye care service in this community, no doubts contributed to the relatively 262 high prevalence of visual impairment. Eye diseases that would have been detected earlier and intervention given, continue to persist and deteriorate, eventually progressing to blindness. None of the General 263 hospitals in our study area has any form of eye service. The available state owned hospitals that have eye 264 sections are at Port Harcourt, Okirika, Ahoada and Bori. Unfortunately, the distance from our study area to 265 266 these facilities, the logistics and costs involved hinder majority from accessing quality eye services. The greater majority remain in the community with their problem until they may become blind. The 267 observation in this rural community is not peculiar to Etche as similar observations have been reported in 268 other rural communities in the Nigeria^{10,22}. The causes of blindness in this study are preventable and 269 270 treatable if detected early.

271 CONCLUSION

- The most common ophthalmic problems among adults, who are predominantly farmers, in this study are Presbyopia, Refractive Error, Cataract, Allergic Conjunctivitis and Pterygium and they accounted for more than two-third of the ocular problems and are dependent on gender and occupation.
- 275 The lack of regular health education, inaccessibility of health facilities and the nature of their occupation
- 276 may be a contributing factor to the ocular diseases found in this study. The state Government should
- 277 therefore, make eye care services available.
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