DATA ANALYSIS ON DIABETES MELLITUS

The summary table below was extracted from the records of the University of Benin Teaching Hospital UBTH, Benin-city, on Diabetes Mellitus across different age groups ranging from the year 2018 to 2021.

Table 4.2.1. Diabetes Mellitus across different age groups.

	AGE GROUP										TOTAL	PERCENT
	YOUNG				AGED							
YEAR	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	TOTAL	PERCENT
2018				14	29	28	14				85	3.96
2019	4		7	57	231	272	154	60	7		792	36.97
2020		2	10	62	174	176	100	39	4		567	26.47
2021			14	71	157	207	171	68	9	1	698	32.58
TOTAL	4	2	31	204	591	683	439	167	20	1	2142	100
PERCENT	0.19	0.09	1.45	9.52	27.59	31.88	20.49	7.79	0.93	0.05	100	

	AGE GROUP										TOTAL
	YOUNG				AGED						
YEAR	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	TOTAL
2018				14	29	28	14				85
2019	4		7	57	231	272	154	60	7		792
2020		2	10	62	174	176	100	39	4		567
2021			14	71	157	207	171	68	9	1	698
TOTAL	4	2	31	204	591	683	439	167	20	1	2142

From the analysis carried out on 2142 persons with case of Diabetes Mellitus from age 0 to 100 years, from the period of 2018 to 2021 shows that, diabetes mellitus is highly common with persons around 41 to 70 years with a cumulative percentage of 79.96 which amount to 1713 cases out of 2142 total cases examined. In fact, Diabetes Mellitus is prevalent in persons around age group 51-60. From the table, we have deduced that Diabetes Mellitus is not common with persons from age

0 to 30 and 81 to 100. Also, analysis have showed that there was more cases of Diabetes Mellitus in the year 2019, which amount about 36.97 percent of the total cases examined at UBTH for the period of 2018 and 2021. In 2021, there was also 698 cases of Diabetes Mellitus amounting to 32.58 percent of the total cases examined. From the analysis, we can clearly see that cases of Diabetes Mellitus was very small, about 3.96 percent of the total cases in year 2018.

The chart below present a graphical visualization of the Diabetes Mellitus cases as recorded at UBTH during the period of 2018 and 2021. From the chart, we can easily see that the case of Diabetes Mellitus increases rapidly in the year 2019 of which the most cases were common with persons in the age group 51-56 and 41-50; but almost absent among age group 11-20 and 0-10.
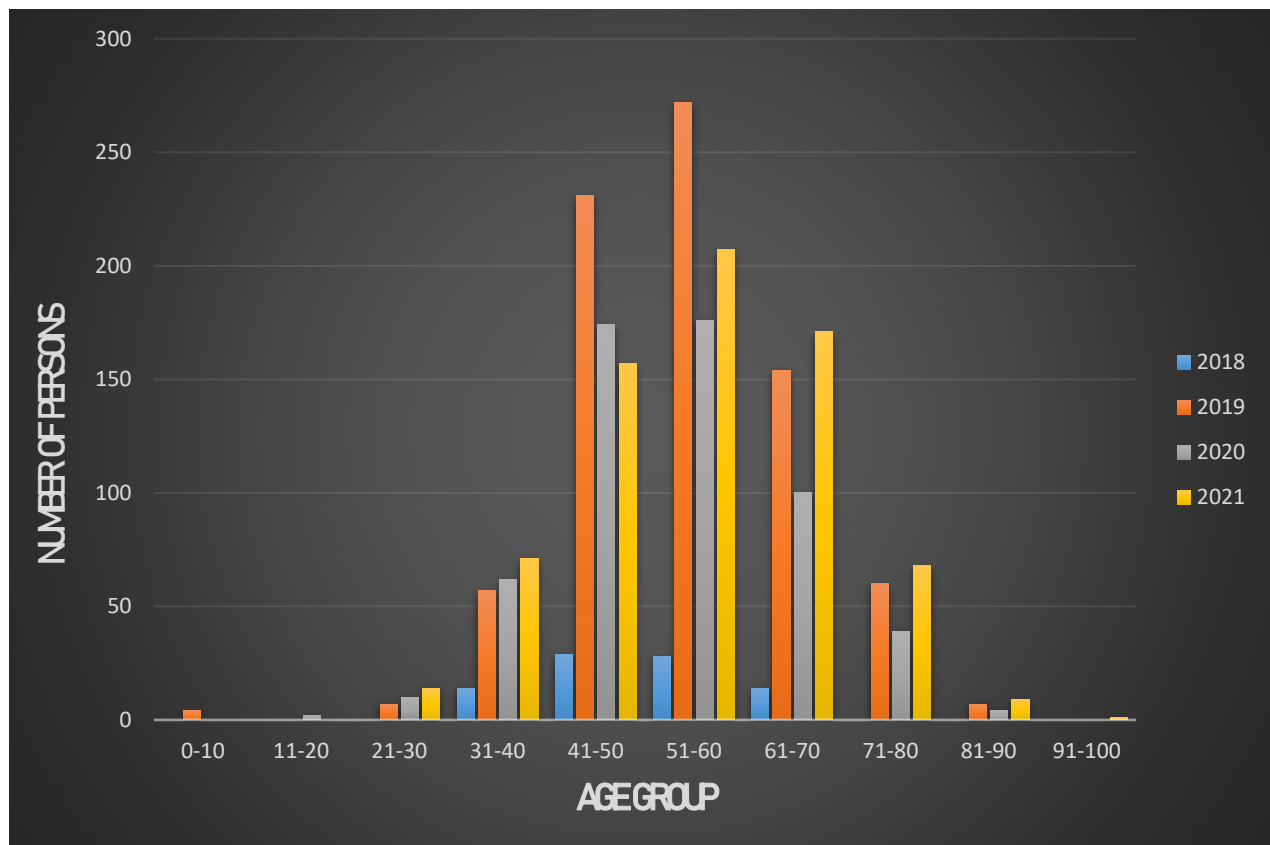

Fig 1: Age distribution of Diabetes Mellitus persons from 2018-2021.

Table 4.2.2. Age Group Distribution

YEAR	AGE GROUP		TOTAL	PERCENT
	YOUNG(0-40)	**AGED(41-100)**		
2018	14	71	85	**3.968254**
2019	68	724	792	**36.97479**
2020	74	493	567	**26.47059**
2021	85	613	698	**32.58637**
TOTAL	**241**	**1901**	**2142**	**100**
PERCENT	**11.25116713**	**88.74883287**	**100**	

From table 4.2, only 11.25 percent of the total number of Diabetes Mellitus are below 40 years; and 88.75 percent of the total number cases are aged persons. Hence, we can deduce that Diabetes Mellitus cases is highly prevalence among the aged group. i.e. persons around 41 and above.
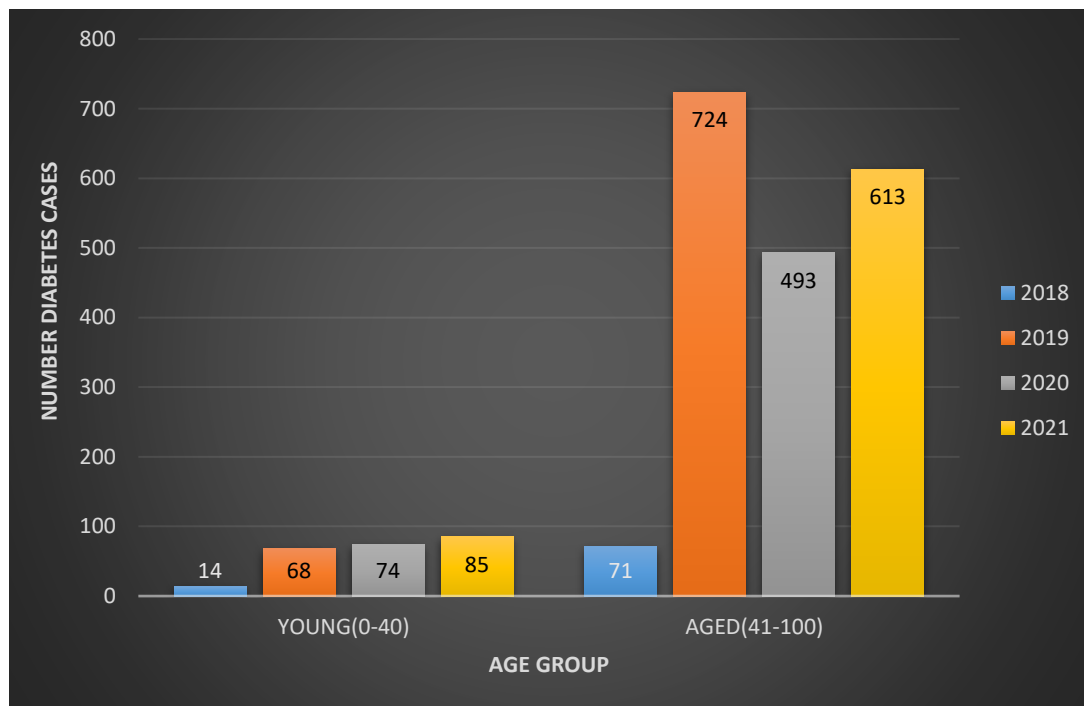

Fig 2: Age Group Distribution

4.3. VALIDATION OF RESEARCH HYPOTHESIS

H_0: There is no association between diabetes and age group.

H_1: There is an association between diabetes and age group.

To test the hypothesis above, we use the chi-square test for association to verify if there is an association between diabetes and age group.

CHI-SQUARE TEST

Table 4.3.1. Years * Age Group Cross-Tabulation

		GROUP		Total
		YOUNG	AGED	
YEARS	2018	14	71	85
	2019	68	724	792
	2020	74	493	567
	2021	85	613	698
Total		241	1901	2142

Table 4.3.2. **Chi-Square Tests:**

	Value	Degrees of freedom	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.393[a]	3	0.016
Likelihood Ratio	10.489	3	0.015
Linear-by-Linear Association	1.948	1	0.163
N of Valid Cases	2142		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.56.

DECISION: From the chi-square tests table, we have the Pearson Chi-Square statistic value of 10.393 and a p-value of 0.016. since the p-value of 0.016 is less than 0.05, we reject the null

hypothesis H$_o$. i.e. it is significant, and we conclude that there is an association between diabetes and age group.

Ho: There is no increase in the number of diabetic patients in Nigeria between 2018 - 2021.

H$_1$: There is an increase in the number of diabetic patients in Nigeria between 2018 - 2021.

The statistical tool that is suitable for testing the hypothesis above is the chi-square test for association or independence.

From the chi-square table above, out of the total 2142 diabetes patients, 241 were young which account about 11.25% of the total samples; and 1901 were aged which account about 88.75% of the total number of diabetes patients. Hence, diabetes mellitus is more prevalent in aged group than the young group. In fact, from the chi-square tests we conducted as presented in table 4.3.2, we have that the result is statistically significant; and hence, there is an increase in the number of diabetes in 2018-2021.

Ho: There is no difference between the means of the age groups.

H$_1$: There is a difference between the means of the age groups.

To test this hypothesis, we use the t-test for paired two sample means. The result of the analysis is shown below;

Table 4.3.3. t-Test: Paired Two Sample for Means

	YOUNG(0-40)	AGED(41-100)
Mean	60.25	475.25
Variance	1000.25	81528.25
Observations	4	4
Pearson Correlation	0.896146143	
Hypothesized Mean Difference	0	
Degree of freedom	3	
t Statistic	-3.222399995	
P(T<=t) one-tail	0.024247758	
t Critical one-tail	2.353363435	
P(T<=t) two-tail	0.048495516	
t Critical two-tail	3.182446305	

DECISION:

From the t-test table, we have a p-value of 0.048 for the two-tail test. This probability value is significant and hence, we reject the null hypothesis and conclude that there is a difference between the means of the two groups.