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STATISTICAL APPROACH TO CREATE REDEVELOPMENT ANDREHABILITATION FOR THE DEVELOPMENT OF ECONOMIC, INFRASTRUCTURE AND HEALTHCARE POLICIES DURING POST COVID-19

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Abstract: The current crisis of the COVID-19 pandemic has greatly rampaged almost all countries around the globe with the sporadic spreading of the infection. The number of causalities with the infection has been increasing day by day in an accelerated manner and several governments around the world took various measures for reducing the spread of infection. The most critical part in overcoming this global downturn lies in almost all the sectors of every country. On account of this, a research study was conducted by surveying around 53 Indian people to figure out some of the efficient and provoking ideas to create some ambient "Redevelopment and Rehabilitation" strategies for the obstacles that are to emerge during the post-COVID-19 scenario.Despite the low rankings in the gender gap index depicting reduced privilege for women in Indian society, it becomes extremely important to consider their opinions. Hence gender bias in the proposed strategies could be further reduced ensuring better improvisation of the solutions. The study confirmed the absence of gender bias in the responses and helped the prediction of various schemes for the development of economic, infrastructure, and healthcare policies of the country.

Keywords: COVID-19, Statistical Approach, Chi-Square test, Redevelopment, Rehabilitation, Economic, Infrastructure, HealthCare, Post COVID-19.

1. INTRODUCTION

The COVID-19 pandemic has enabled governments of the world to evaluate their capabilities and capacities in meeting the crisis. Thenceforth, the redevelopment and rehabilitation of the economy, health care, and infrastructure of the country take the utmost priority to overcome the serious threats faced due to the pandemic.

On the other hand, epidemics like cholera do not persist for more than 2-3 weeks. This might be due to several practices like maintaining good infrastructure for water supply, proper sanitation, and personal hygiene practices. The "Swachh Bharat" campaign laid emphasizes on the proper sanitation and the "National Vaccine Policy 2011" functioned with objectives to develop vaccines for diseases that might lead to potential disease outbreaks in the country. Hence this study will emphasize Herewith, by this study some strategies that were of public concern and were surveyed for figuring out the solutions that can be implemented shortly for overcoming the catastrophic COVID-19 pandemic. It is also necessary for verifying the aspect of gender bias with the obtained responses to propose efficient schemes for the redevelopment and rehabilitation of the state. The gender bias was tested using a right-tailed chi-square test to estimate whether the male and female responses are independent in the survey.

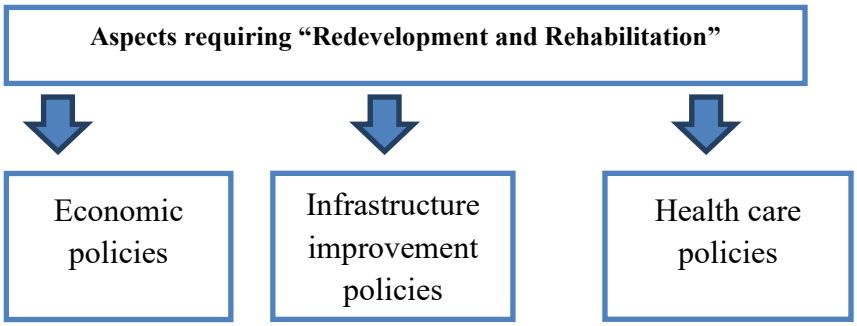


Figure1. Redevelopment and Rehabilitation

2. LITERATURE SURVEY

2.1 Impact of COVID-19 on the society

COVID-19 being a highly transmissible pathogen should be dealt with more effectively especially in India with a population of 1.34 billion making it the second most populous country in the world. To successfully curb the transmission the Ministry of Health and Family Welfare of India has raised awareness and formulated several wartime protocols (1). As a measure, the Government of India announced a national wide lockdown throughout the country for a longer duration potentially influencing the monotony of every citizen in the country (2). The slowdown also impacted moreover all the sectors of the economy causing a stir for both the consumers and the firm (3,10). At this juncture, India also witnessed a mass exodus of the migrant population during the lockdown with concerns raised with respect to unemployment, social security as well as healthcare crisis. So, it becomes inevitable for reframing or emphasizing the current development strategies (4).

2.2 Gender bias in India

Despite the increasing growth rate and ample measures established by the government, gender inequality seems to be an unavoidable part of Indian society. Gender bias not only halts the life improvement of women, but it poses a contagious threat to the young generations of the country (5). As the world changes industrially, it is important to adjust accordingly by minimising the old gender valuations (6).

2.3 Chi-square test- statistical measure of gender bias

Chi-square independence is one of the most important statistical approaches for a testing hypothesis when the data is nominal. It also offers information about the categories that are responsible for the observed difference (7). The categorical variables might be arranged in a contingency table according to the count or frequency of the data. Rows and columns in the contingency table could then be analyzed for independence using the calculated p-value and test statistic (8).

3. METHODOLOGY

An electronic questionnaire with eleven questions was circulated among the people and a total of 53 responses were collected from 41 female and 12 male volunteers. The chi-square test was performed by using Microsoft Excel and results were analysed for both general and gender-based aspects and some solutions were portrayed as results.

Assumptions made in the study:

1. Random data were withdrawn from the population
2. Every response has values and there were no null responses
3. The sample is adequately large to avoid type 2 error
4. The variables chosen for the study are also mutually exclusive

In the chi-square test, the level of significance was assumed to be 5% and the hypothesis were as follows

Null hypothesis: The responses of both male and female are independent

Alternate hypothesis: The responses of male and female are dependent.

$$Expected\ value = \frac{(Grand\ total\ of\ row)(Grand\ total\ of\ column)}{(Sum\ of\ grand\ total\ of\ row\ and\ coloumn)}; \chi^2 = \frac{(E_o - E_e)^2}{E_e}$$

Where χ^2 is chi-square statistic; E_o is observed value; E_e is expected value

The overall analysis of the responses was depicted as pie chart and the chi-square test was depicted using contingency table at 5% significance level as generated by Microsoft Excel and it was further analysed.

3.2 Results

The observed results for the survey questions are as follows

Question 1: Do you think lockdown was an effective measure to control COVID-19 infection?

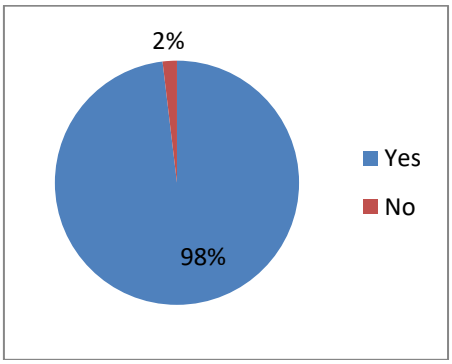


Figure 2. Pie chart representation of responses for "Question 1"

Table 1. Contingency table for "Question 1"

	Observed frequency			Expected frequency			Chi-square statistic		
	Yes	No	Grand total	Yes	No	Grand total	Yes	No	Grand total
Male	12	0	12	11.77358	0	11.77358	0.004354	0	0.004354
Female	40	1	41	40.22642	0.773585	41	0.001274	0.066268	0.067542
Grand total	52	1	53	52	0.773585	52.77358			0.071896
	Degree of freedom			1			χ^2		0.071896

From figure 2, it is analysed that a majority of the participants believed that lockdown was an effective measure to curb the spread of the infection. Table 1 indicates that Chi- square value lies in acceptance region, so the null hypothesis is accepted.

Question 2: Will you prefer to hang out with someone who got cured from covid19 infection?

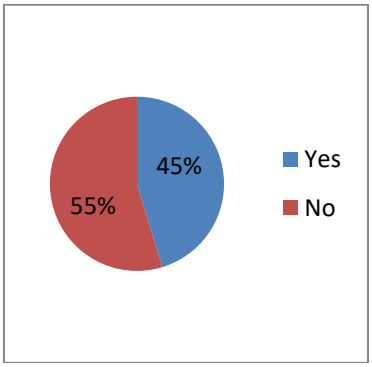


Figure 3. Pi chart representation of responses fr "Question 2"

Table 2: Contingency table for "Question 2"

	Observed frequency			Expected frequency			Chi-square statistic		
	Yes	No	Grand total	Yes	No	Grand total	Yes	No	Grand total
Male	3	9	12	5.433962	6.566038	12	1.090212	0.902245	1.992457
Female	21	20	41	18.56604	22.43396	41	0.319087	0.264072	0.583158
Grand total	24	29	53	24	29	53			2.575615
	Degree of freedom			1					
							χ^2		2.575615

From figure 3, it is analysed that a majority of the participants prefer not to hang out with the one recovered from the infection. Table 2 indicates that Chi- square value lies in acceptance region, so the null hypothesis is accepted.

Question 3: Do you spend more time with mobile phone during lockdown?

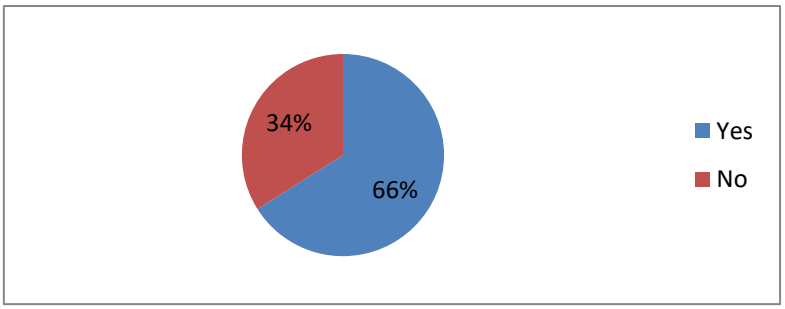


Figure 4. Pie chart representation of responses for "Question 3"

Table 3: Contingency table for "Question 3"

	Observed frequency			Expected frequency			Chi-square statistic		
	Yes	No	Grand total	Yes	No	Grand total	Yes	No	Grand total
Male	8	4	12	7.924528	4.075472	12	0.000719	0.001398	0.002116
Female	27	14	41	27.07547	13.92453	41	0.00021	0.000409	0.000619
Grand total	35	18	53	35	18	53			0.002736
	Degree of freedom			1					
							χ^2		0.002736

From figure 3, it is analysed that a majority of the participants had an increased usage of mobile phones than usual. Table 3 indicates that Chi- square value lies in acceptance region, so the null hypothesis is accepted.

Question 4: Will you support the construction of multi-storeyed buildings for slum clearance?

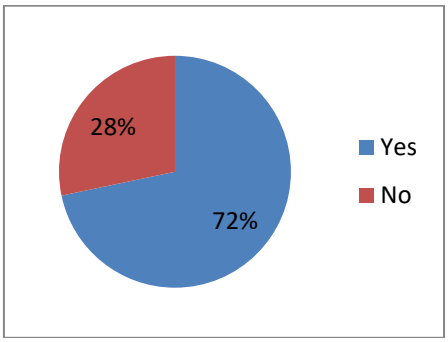


Figure 5. Pie chart representation of responses for "Question 4"
Table 4: Contingency table for "Question 4"

	Observed frequency			Expected frequency			Chi-square statistic		
	Yes	No	Grand total	Yes	No	Grand total	Yes	No	Grand total
Male	10	2	12	8.603774	3.396226	12	0.226581	0.574004	0.800585
Female	28	13	41	29.39623	11.60377	41	0.066316	0.168001	0.234318
Grand total	38	15	53	38	15	53			1.034902
	Degree of freedom			1					
							χ^2		1.034902

From figure 4, it is analysed that a majority of the participants believe multi-storeyed buildings could be constructed for slum-clearance. Table 4 indicates that Chi- square value lies in acceptance region, so the null hypothesis is accepted.

Question 5: Do you think the unemployed graduates would be ready to take up a job in building the Indian infrastructures associated with "house for all" policy?

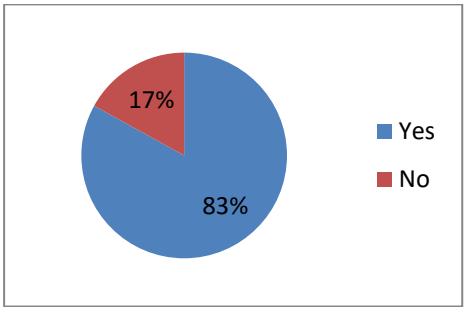


Fig 6. Pie chart representation of responses for "Question 5"
Table 5: Contingency table for "Question 5"

	Observed frequency			Expected frequency			Chi-square statistic		
	Yes	No	Grand total	Yes	No	Grand total	Yes	No	Grand total
Male	9	3	12	9.962264	2.037736	12	0.092946	0.454403	0.547348
Female	35	6	41	34.03774	6.962264	41	0.027204	0.132996	0.1602
Grand total	44	9	53	44	9	53			0.707548
	Degree of freedom			1					
							χ^2		0.707548

From figure 5, it is analysed that a majority of the participants believe the unemployed graduates would participate in the infrastructure development projects of India. Table 5 indicates that Chi-square value lies in acceptance region, so the null hypothesis is accepted.

Question 6: Will you appreciate the "Make in India" policy?

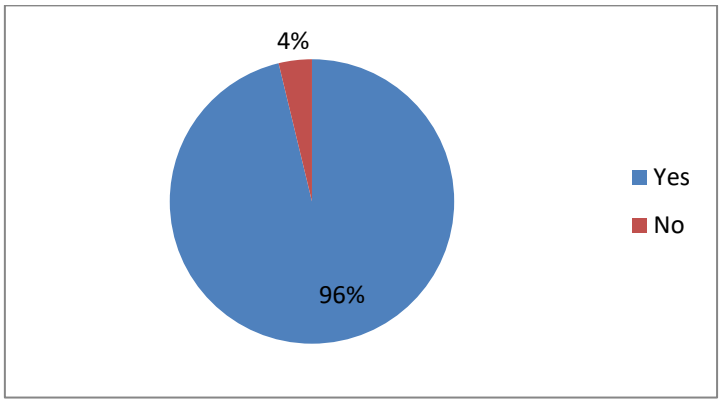


Figure 7. Pie` chart representation of responses for "Question 6"

Table 6: Contingency table for "Question 6"

	Observed frequency			Expected frequency			Chi-square statistic		
	Yes	No	Grand total	Yes	No	Grand total	Yes	No	Grand total
Male	12	0	12	11.54717	0.45283	12	0.017758	0.45283	0.470588
Female	39	2	41	39.45283	1.54717	41	0.005197	0.132536	0.137733
Grand total	51	2	53	51	2	53			0.608321
	Degree of freedom			1					
							χ^2		0.608321

From figure 6, it is analysed that a majority of the participants support the "Make in India" policy. Table 6 indicates that Chi- square value lies in acceptance region, so the null hypothesis is accepted.

Question 7: What do you think is better for improvement of Indian economy?

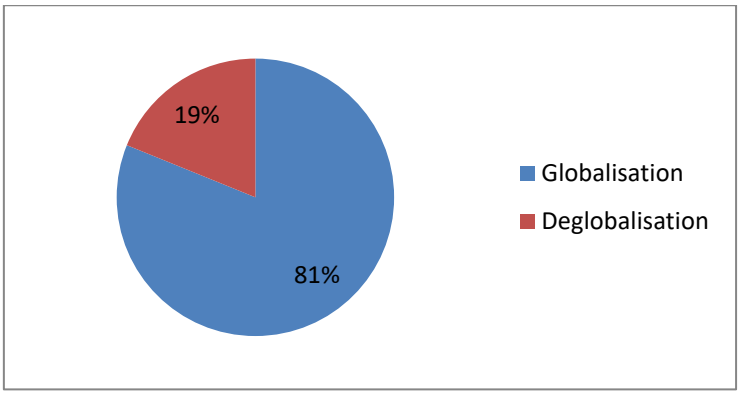


Figure 8. Pie chart representation of responses for "Question 7"

Table 7: Contingency table for "Question 7"

	Observed frequency			Expected frequency			Chi-square statistic		
	Degobalisation	Globalisation	Grand total	Deglobalisation	Globalisation	Grand total	Deglobalisation	Globalisation	Grand total
Male	1	11	12	2.264151	9.735849	12	0.705818	0.164144	0.869961
Female	9	32	41	7.735849	33.26415	41	0.206581	0.048042	0.254623
Grand total	10	43	53	10	43	53			1.124584
	Degree of freedom			1					
							χ^2		1.124584

From figure 7, it is analysed that a majority of the participants believe that globalisation would be better for Indian economy. Table 7 indicates that Chi- square value lies in acceptance region, so the null hypothesis is accepted.

Question 8: What type of economy would you prefer to help the needy amid covid19 crisis?

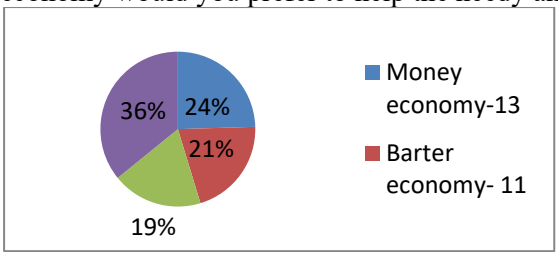


Figure 9. Pie chart representation of responses for "Question 8"

Table 8: Contingency table for "Question 8"

Chi-square statistic				
Money	Barter	Gift	Sacred	Grand total
0.001089	0.892081	0.239151	0.11329	1.245611
000319	0.261097	0.069995	0.033158	0.364569
				1.61018
		χ^2		0.608321

From figure 8, it is analysed that a majority of the participants believe that sacred economy could be adopted to help the needy. Table 8 indicates that Chi- square value lies in acceptance region, so the null hypothesis is accepted.

Question 9: Choose your preference of jobs to be offered post covid19.

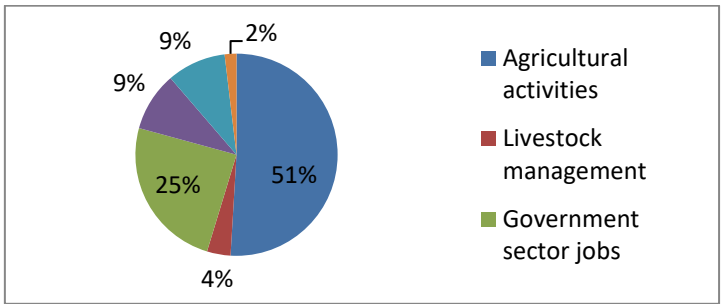


Figure 10. Pie chart representation of responses for "Question 9"

Table 9: Contingency table for "Question 9"

	Chi-Square statistic						
	Agricultural activities	Livestock management	Government sector jobs	Public sector jobs	Business	Nil	Grand total
Male	0.002096	0.661164	0.302371	0.015409	0.015409	2.643082	3.63953
Female	0.000614	0.193511	0.088499	0.00451	0.00451	0.773585	1.065228
Grand total							4.704758
				χ^2		4.704758	

From figure 9, it is analysed that a majority of the participants agricultural jobs to other jobs. Table 9 indicates that Chi- square value lies in acceptance region, so the null hypothesis is accepted.

Question 10: Do you have a health insurance?

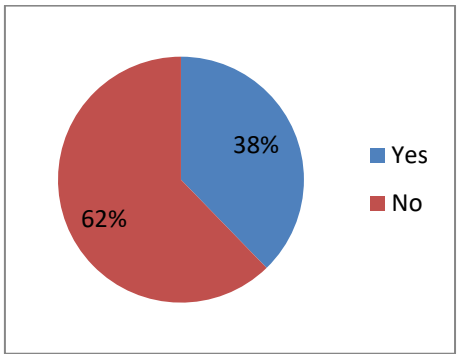


Figure 11. Pie chart representation of responses for "Question 10"

Table 10: Contingency table for "Question 10"

	Observed frequency			Expected frequency			Chi-square statistic		
	Yes	No	Grand total	Yes	No	Grand total	Yes	No	Grand total
Male	5	7	12	4.528302	7.471698	12	0.049135	0.029779	0.078914
Female	15	26	41	15.4717	25.5283	41	0.014381	0.008716	0.023097
Grand total	20	33	53	20	33	53			0.102011
	Degree of freedom			1					
						χ^2			0.102011

From figure 10, it is analysed that a majority of the participants do not have any health insurance. Table 10 indicates that Chi- square value lies in acceptance region, so the null hypothesis is accepted.

Question 11: Do you really feel that the liquor shops are a posing threat to both the redevelopment and rehabilitation of covid19 crisis?

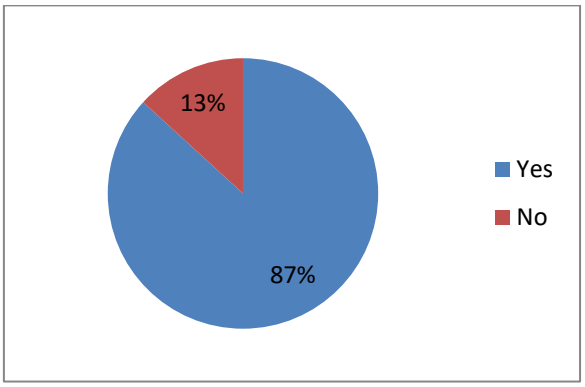


Figure 12. Pie chart representation of responses for "Question 11"

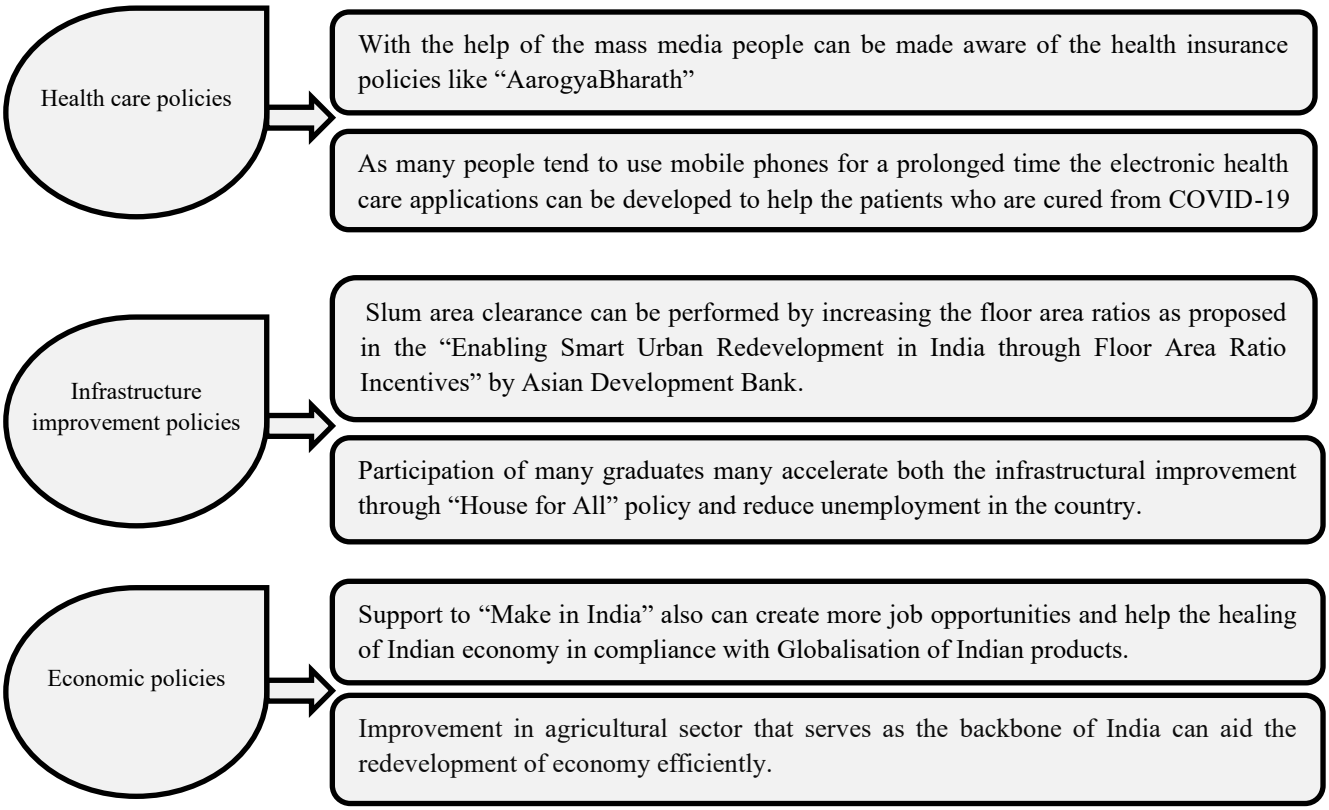
Table 11: Contingency table for "Question 11"

	Observed frequency			Expected frequency			Chi-square statistic		
	Yes	No	Grand total	Yes	No	Grand total	Yes	No	Grand total
Male	10	2	12	10.41509	1.584906	12	0.016544	0.108715	0.125259
Female	36	5	41	35.58491	5.415094	41	0.004842	0.031819	0.036661
Grand total	46	7	53	46	7	53			0.16192
	Degree of freedom			1					
							χ^2		0.16192

From figure 11, it is analysed that a majority of the participants believe that liquor shop posed as a threat to the redevelopment and rehabilitation strategies of the COVID-19 crisis. Table 11 indicates that Chi- square value lies in acceptance region, so the null hypothesis is accepted.

4. CONCLUSION

- A majority of people suggested that the lockdown was an effective measure in the containment of the COVID-19 pandemic; hence this shows the success of mass media and the government playing all roles in making the people aware of the precautions of the pandemic. More people avoided hanging out with the person who got cured of the pandemic emphasizing the unclear research on the complete treatment methodologies for the COVID-19 pandemic.
- Spending time with the mobile phone surged during the lockdown as social distancing was implemented. Slum areas were found to become hotspots for infection in many parts of the country due to a lack of toilet facilities and high population density. Hence slum clearance by multistoried buildings was supported by more people. Many people were willing to work for improving infrastructures regardless of the qualification they hold. This portrays the capability of people with the wide acceptance of job opportunities. Everyone was supporting the "Make in India" scheme that would offer employ many Indians. Globalization is always required as an exchange of resources between countries, hence is also supported by many people. Many people were ready to help the needy amid COVID-19 by following a sacred economy which will enable the liquidity of both the currency as well as the resources among the people.



- Among the people who responded, half were willing to choose the agricultural job offers that might further help the improvement of GDP and food requirements as well.
- More than half were not insured for health showing the improper awareness regarding the government health care insurances.Majority agree the fact that liquor shops are posing as a severe threat for rehabilitation and redevelopment with the fact that alcohol weakens the immune system.As a whole the diagram below illustrates the predicted outcomes,From the gender-based assessment of the responses using Chi-square statistic at 0.05% significance revealed that the responses were not biased based on gender.

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