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Statistical analysis of primary health conditions of lower income population: Special reference to Delhi NCR

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Abstract---Health has always played a crucial role in the development of human capital. It is a causative factor for the overall personal growth of an individual and helps in realizing human capabilities. Alongside other systems of social protection, proper health systems foster cohesive societies and contribute to well-being. Good health improves the overall quality of life by causing a reduction in the risk factors for medical diseases. Different organizations make different policies focused on the improvement of health conditions. In India, The Ministry of Health and Family Welfare works towards welfare & health related matters. While making a policy if we divide the entire population into groups based upon income slabs it will provide us a structure while making schemes. The primary objective is to statistically analyze the primary health conditions of the low income group using a survey that has been done for 433 respondents. In order to check the dependence of the relationship, Pearson's chi-squared test (χ^2) is carried out. The paper explains the causes for the prevailing primary health conditions with special reference to the capital state of Delhi.

Keywords---government policies, health, monthly income, health conditions, disease, low income population.

Introduction

India is the second-most populous country with a 1.4 billion population according to the census report. [2] In 2021, it ranked 66 out of 195 countries with an overall Index score of 42.8. It faces multiple hindrances when it comes to the betterment of its citizen's health conditions via implementing new health schemes. The government of India is dedicated to the same goal and tries to include more people under the bracket of these policies every year by increasing the budget spending. According to a recent survey, in rural India, 75% of the 180 million households with the highest-earning members earn less than \$83, and 40% don't even own any land, just toil as manual factory workers or laborers. The findings of the Socio-Economic Census 2011, state that 25% of the rural households still don't own a phone. Out of every four Indians, one has a risk of dying from an NCD, and around 5.8 million die because of diabetes, cancer, stroke, etc every year out of which about 17 lakh deaths are caused by heart diseases according to the World Health Organization. Thus these people require government support via multiple schemes and policies for the enhancement of their lifestyle. The focus of the paper will be on deeply examining this population group and stating the factors that act as the major contributors to the prevailing health conditions.

Objectives of study

1. To analyze the factors affecting primary health conditions of the lower-income population of Delhi NCR.
2. To study the statistical relationship between primary health conditions and monthly household income.

Research Methodology

The research methodology is exploratory research. For collecting primary healthcare-related data of the urban poor population, the survey was done in multiple locations across Delhi NCR region for 433 respondents. For secondary data collection, government records, websites, journals, magazines were used. More than 50% respondents were independently employed, whereas the rest worked in factories or as drivers. In order to check the dependence of the parameters, Pearson's chi-squared test (χ^2) is carried out between the two defined parameters of health conditions and monthly household income, for identifying the said objectives.

Factors affecting primary health conditions

Multiple factors influence the primary health conditions of the rural population [24]. Good health is a foundation to a wholesomeness and conscientious living. Healthy people are more productive and positively impact the economy. Thus, government should increase its spending on health care. The following are the major factors that influence the health conditions of the rural population.

Health Schemes

Health schemes are the best medium to avail adequate resources. [18] They include schemes related to insurance and guidelines related to the distribution of important medicines. For covering maximum number of people, the government introduces all the policies & schemes with the help of the Ministry of Health and Family. Famous government promotional policies include:

- a) Central Government Health Scheme
- b) Rashtriya Swasthya Bima yojana
- c) Pradhan Mantri Suraksha Bima Yojana
- d) Rashtriya Swasthya Bima yojana

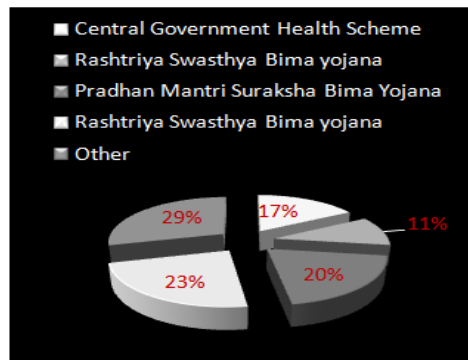


Figure 1: Health scheme opted by respondents

Vaccination

The vaccination increases protection against the infection via strengthening immune system. Developing a vaccine requires a significant amount of time which generally ranges from 10 to 15 years because of the rigorous process and the vaccines are monitored even after being used. [12] The disease slows down and stops once enough community members are vaccinated.

They are divided into four major categories:

- a) Live-attenuated
- b) Inactive vaccines
- c) Subunit, recombinant, polysaccharide & conjugate
- d) Toxoid vaccines

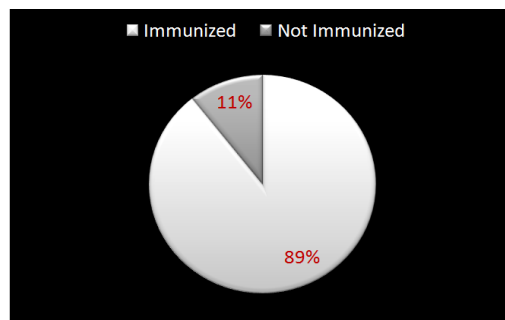


Figure 2: Immunization status of respondents

Genetic Disorders

They are inherited medical conditions that are mainly caused by a DNA abnormality. One can inherit a gene mutation from either of the parents. Due to the high prevalence of recessive alleles, India is home to multiple genetic disorders. The following are the most prevalent ones in the country:

- a) B.P
- b) Diabetes
- c) Thalassemia
- d) Psychiatric Disorders

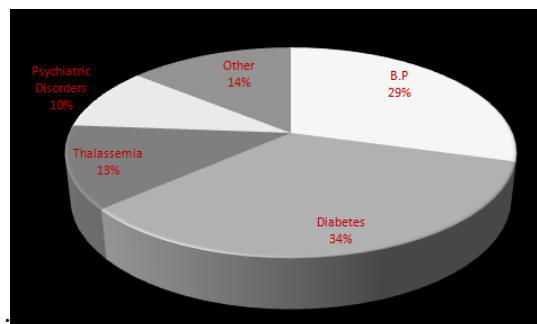


Figure 3: Genetic disorder among respondents

Chronic Conditions

It mainly includes diseases that are persistent and have long-lasting effects. Due to this, patients require continuous medical attention. Use of excessive alcohol, tobacco, poor nutrition, smoking, and physical inactivity are some of the major contributors to the leading chronic diseases.

The following list includes the major chronic diseases in the country:

- a) Arthritis
- b) Cancer
- c) Chronic Pain
- d) Depression
- e) Diabetes

- f) Heart Disease
- g) High BP
- h) Asthma

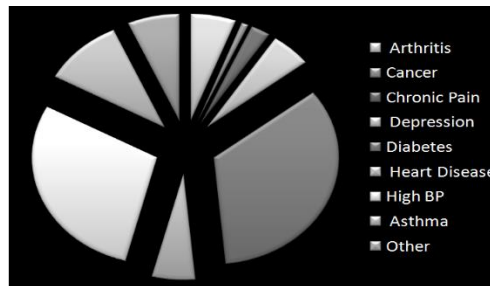


Figure 4: Chronic conditions among respondents

Monthly Medical Expenditures

Most of the respondents do not visit the hospital for regular body checkups that can help doctors diagnose a disease before it becomes dangerous. The complexity and risk involved decrease drastically if diagnosed at an early stage. Moreover, routine checkups provide the best chance of detecting and fighting a disease without any major complications. Even though it is so essential, the monthly expenditure is less than 1000 rupees for most of the respondents.

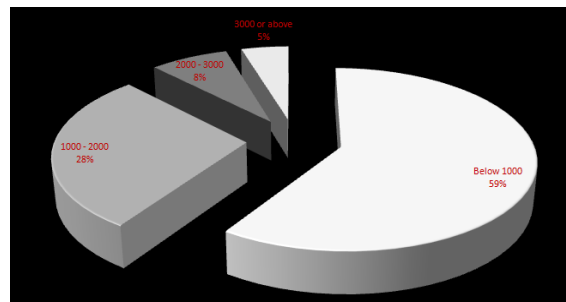


Figure 5: Monthly expenditure (INR) of respondents on health related issues

Nutrition

A balanced diet supplies an adequate amount of nutrients that is required by your body in order to work effectively. [24] Nutrition is all about eating a balanced diet. According to the latest UNICEF report on the food security state, 189.2 million people are undernourished in India. Unfortunately, respondents' diets were low in essential nutrients and excessive in saturated fats. Due to poor nutrition, they face the following problems frequently:

- a) Fever
- b) Flu
- c) Cold and Cough
- d) Stomach Ache
- e) Muscular Pains

- f) Headache
- g) Skin Problems

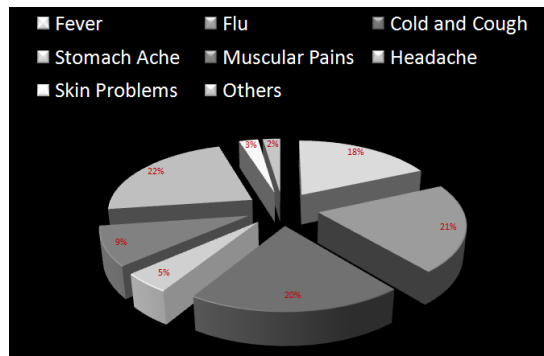


Figure 6: Frequent health problems faced by respondents

Hospitals/Clinic Facilities

Most of the respondents preferred government hospitals over private due to low fees. But unfortunately, these hospital does not have access to equipment for modern diagnosis and treatment. [4] The respondents don't have any access to a primary healthcare team or personal family doctor. Because of the following reasons, the respondents visit the hospital infrequently even in case of sickness.

- a) No nearby facility
- b) Inconvenient facility timings
- c) Long waiting time
- d) Bad quality

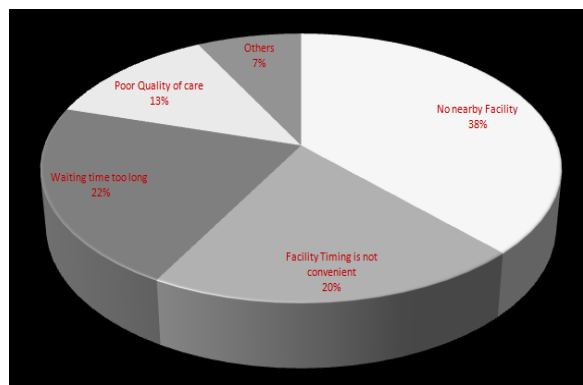


Figure 7: Reasons for infrequent hospital visits

Household/Area Conditions

The everyday hygiene practices are extremely essential in preventing the spread of disease in everyday settings and result in increasing the life expectancy. Moreover, it improves your overall wellness. Unfortunately, most of the respondents do not have access to filtered water. The last check-up camp that was set up in their areas was more than 6 months ago and most of the people do

not have any emergency first aid kits at home. Air ventilation is poor and mainly public toilet facilities are used by respondents.

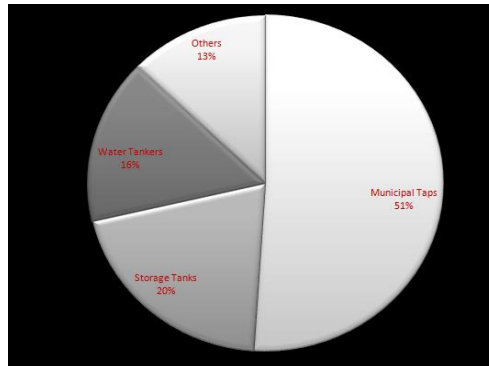


Figure 8: Source of drinking water

Factors affecting awareness regarding personal health

Multiple factors affect the awareness regarding personal and community health amongst the rural population due to which people are not available to avail of basic medical facilities that are provided under the government schemes free of cost. Thus, there is an urgent need for technology and continued training for doctors that would help them provide high-quality service in these areas. Some of the major factors that affect awareness are listed below:

Social Factors

Prevalence of social myths among vulnerable groups like women, children etc in rural areas creates a major hindrance to social awareness. Moreover, social factors like casteism, substance abuse, discrimination, malnutrition, etc create social disorganization [20]. Prevalent misconceptions in the minds of Indian parents regarding modern medical practices and immunization creates nationwide problems. Thus, awareness must be created using modern technologies to change the mindset.

Huge Patient-Load

Serving a population of 1.4 billion [15] is difficult when it comes to managing health care facilities. There is a significant burden in terms of cost and time for the rural population to access health care services. Thus, modern technology should opt for increasing operational efficiency and virtual care protocols must be promoted to reduce patient load.

Poor Health Literacy

The overall literacy rate in India is just 74.04% as per the 2021 national survey. The prime reason for this is the complex web of social and economic divides in the country. Due to this, there is no health related awareness among the local communities which further prevents the proper flow of information related to

community hygiene, government health schemes and vaccination matters. Thus there is a crucial need for sensitization in these rural areas.

Acute Shortage Of Human Capital In the Health Sector

The density of qualified health workforce in India is 11 to 12 doctors and nurses per 10,000 persons which is almost half of the WHO recommendation. This creates a lack of balance between quality supply and demand. Moreover, the health care workforce planning has to face multiple issues like evolving illnesses, and an aging population. Thus, India needs huge investment in this sector.

Lack Of Awareness Regarding Health Insurance

More than 35% of hospitalized Indians in rural areas borrow heavily to cover medical expenses since most of them fall below the poverty line. According to a recent report by FICCI & Ernst and Young, healthcare spending in India will double in the next 10 years. Thus, it is extremely important to educate the people living in these rural areas regarding the benefits of health insurance.

Inconsistent Implementation & Infrastructural Issues

There is a lack of framework and regulations regarding infrastructure in India. Due to inconsistent implementation, lots of health projects exceed their cost and time as a result of which there is no proper supply of basic medicine and vaccination in rural areas. This hinders development which in turn creates multiple problems and brings low standards of living.

Inferences drawn from the data set

Our mind finds it easier to understand data when presented in terms of numeric figures. So, we must quantify the status of healthcare and other factors to increase the efficiency of data processing. A survey has been conducted and Pearson's chi-squared test (χ^2) is carried out to find out whether there is any dependence among the parameters which data intends to imply. In order to find out results via data analysis application using Statistical Package for the Social Sciences, a sample size of 433 respondents was considered relevant.

Crosstabs

Case Processing Summary						
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Family Monthly Income Of Respondant * Overall Health	433	100.0%	0	0.0%	433	100.0%

Table 1: Frequency Distribution of Family monthly income of respondent vs Overall Health.

433 respondents completed the survey out of which 100% were present in the dataset and there is 0% missing information about the respondents.

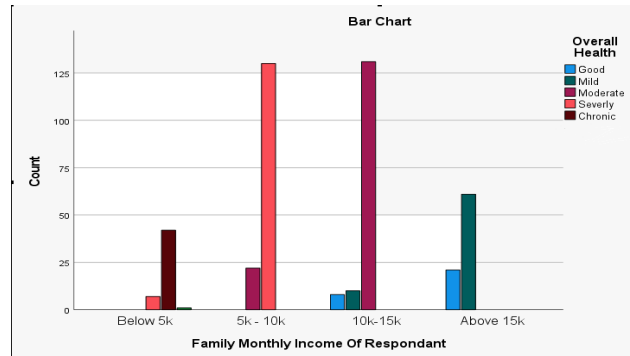


Figure 9 : Family Monthly Income Vs Overall Health

Pearson's chi-squared test (χ^2) is a non parametric statistical test used to find out whether there is relation between the categorical variables or data sets [23]. Moreover, it measures whether observed data sets fits with expected distribution if the variables are independent in the latter case. It is used for relatively large sample size where categorical variables are not paired in any way.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	996.396 ^a	15	.001
Likelihood Ratio	851.755	15	.001
Linear-by-Linear Association	147.124	1	.001
N of Valid Cases	433		

Table 2: Chi-Square Test Table

While reading the above table, the focus should be on the results of the "Pearson Chi-Square" row. The Pearson Chi-Square is equal to 996.396 and the p is equal to .001. Thus, the p-value is lower than the chosen significant level i.e. 0.05, so we will have to reject the null hypothesis. This shows that there is a statistically crucial association between the family monthly income of the respondents and their overall health.

Conclusion

After analyzing the data, it is clear that there is a strong relationship between health and family income. People in urban areas have more access to healthcare than those living in rural backgrounds. Proper use of technology can help in

overcoming the obstacles that prevent proper flow of information regarding personal health and hygiene. Moreover, it reduces human errors & improves the clinical outcomes. Social media platforms must be used to address the misconceptions in the minds of rural population regarding modern medical practices. The focus of government while planning initiatives, schemes and policies should be on improvement of socio-economic conditions of underprivileged sections because irrespective of the household income, people should be able to avail basic medical facilities. These schemes should be launched successively and proper implementation must be ensured. This suggests that in order to achieve 100% success we need to spread awareness & work on all the different problem related parameters simultaneously.

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