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## From the Desk of the Chief Editor.....

Dear IJAR&D Readers,

Greetings for a Successful 2020,

God keep you all good in health, safe and secure from the pandemic.

The new issue is reaching your hands at a very tough time. The world continues to be under the grip of Covid-19. Even as the claims are being made about the vaccine, the virus has put into quandary the academicians in particular. They are expected to deliver what was never imagined. Undoubtedly, like the doctors, teachers too are trying to cope up with digital tools. Institutions have gone online to teach and train students. The regulatory bodies have also issued guidelines but nothing seems to reduce uncertainty around as economic implications are too severe. You shouldn't be surprised to find many Corona related papers in the 11th issue of IJAR&D. It was an obvious choice. I appreciate the contributors to conduct study to understand the knowledge and attitude of Indians towards pandemic or how can India become self-reliant against the backdrop of the current crisis. Another paper examines the spillover of Covid-19 on the worst-hit tourism industry. In nutshell, the three papers portray a clear picture of pandemic and its impact on psychology, economy and society at large. It is heartening to note that the respondents surveyed were aware of the lurking danger and precautions to be taken. It will however be wrong to assume the findings are accurate for the entire India. People are seen defying the medical protocol at the risk of their own lives. They even forget that their folly will not only be suicidal for them but may also bring their entire family under risk. The government has rightly been promulgating new laws and amending the existing ones to prevent people from falling prey to the virus. The paper based on the complementary role of health and economy has rightly praised the government to act swiftly to make legal readjustments to protect the interests of commoners to business giants.

The other papers highlight certain chronic problems such as malnutrition among women, craze for sons in an era filled with superlative achievements of women in all areas, electricity consumption pattern in a highly literate state and volatility of Bitcoin in post-demonetized India. The contributors have taken pain to derive conclusions and made useful suggestions. Hats off to their inclination for quality research work.

Before summing up, I would like to urge the academicians to ponder over as to how can we overcome the situation with flying colors? It is badly needed as only innovative measures and courage can help recover the depressed economy. We must aim for V type recovery, for other options like U,W or L are time consuming and not fit for a country like India. Fortunately, the agriculture sector has done well but other constituents of the economy have yet to yield the results envisioned in relief packages or government policies. As academicians, we can't remain mute spectators but need to watch the trends with a sense of alarm. Such an approach will help us justify the noble position society has bestowed upon us for ages.

I really look forward to a proactive attitude from educationists to outsmart corona.

Wishing you all the very best,

**Prof. (Dr.) Mazhar Naqvi**

*Editor-in-Chief*



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# An Empirical Study on knowledge and Attitude of Indian Population Towards COVID-19 Pandemic

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## **Abstract**

*Novel Corona Virus Disease originated from China has rapidly crossed the borders, and still infecting people throughout the world. With the proliferation in the number of infected people, the situation is getting worse and leading to increase in level of anxiety and stress. Anxiety is considered as a common response to any stressful situation. Apart from this, knowledge level should also be assessed in order to know the status of people regarding this pandemic. Therefore, this study attempted to assess the knowledge, attitude and perceived mental healthcare need in Indian population towards the COVID-19 pandemic. This study is exploratory and descriptive in nature and the data was collected from Individuals, doctor, Nurses and other staff members. This study reveals that almost 90% people are aware about COVID-19 pandemic.*

## **Introduction**

Wuhan city in China which is one of the largest city in the country was engulfed by a pneumonia outbreak in December 2019. It was caused due to Novel Corona virus which spread to other countries of the world in the coming time. Its impacts were severe and still ongoing. Chinese scientists was able to pin-point a Covid-19 strain from the patients' group in Wuhan. They were helped by an early investigation of the new cases and obtaining clinical and epidemiologic data about those cases.

The first case was reported in December 2019. Five patients were hospitalized from 18<sup>th</sup> Dec 2019 to 29<sup>th</sup> Dec 2019 because of Acute Respiratory Disease Syndrome. Out of these 5 patients, one died in the hospital. The number of cases rose to 41 by 2<sup>nd</sup> January 2020 out of which less than 50% had other diseases like diabetes, blood pressure, or heart disease. Total cases reported in 25 provinces of China by 25.01.2020 were 571. As of 25<sup>th</sup> January, there were 1975 confirmed belongings of Covid-19 infection in main land China and 56 deaths due to that infection. However, a report on 24<sup>th</sup> Jan 2020 concluded that the cumulative count of covid-19

infection in China was 5502. As of January 30, 2020, 7730 cases contain be long-established in China and previous cases must occurred report from several countries.

Coronavirus, first discovered in 1960, are a large family of viruses. However, not all coronavirus-es cause illness in humans. Rarely, animal coronaviruses evolved into human coronavirus that subsequently infects individuals and then they spread between people.

There are 5 known strains of Human Coronaviruses. Common Human Coronaviruses:

1. Alpha coronaviruses: HCoV-229E, HCoV-NL63
2. Beta coronaviruses: HCoV-OC43, HCoV-HKU1
3. SARS-CoV-
4. MERS-CoV
5. SARS-CoV-2

## **Transmission**

Respiratory epidemics be able in the direction of spread during droplet of different sizes: after the droplet scraps

be  $>5\text{-}10\mu\text{m}$  in diameter referred towards like respiratory droplets, and while next are  $<5\mu\text{m}$  in diameter, are linked to as droplet nucleus. COVID-19 virus is mostly spread among public through contact of the other infected body and carried by the wind spread be not in print.

Droplet transference can occur as a human being is in in close up get in touch with (within 1 m) someone who have symptom of coughing before sneezing as well as so, on threat of contain oral cavity and nose or conjunctiva revealed towards potentially infective respiratory droplet. Transmission may possibly occur during fomites into the direct environment about the infected human being. Consequently, spread of the COVID-19 virus preserve happen in instant contact among contaminated persons with direct contact among cover environment otherwise by things use happening the contaminated human being stethoscope or else thermometer also other medical devices. In the air transmission be divide as of droplet transmission the same as it towards the appearance of microorganisms inside droplet nuclei, which be usually measured towards be particle  $<5\mu\text{m}$  in caliber, be able to stay inside the air for extended period of moment, with survive transmitted towards others above range larger than 1m.

In the air spread might be present possible inside definite conditions also setting during which method otherwise maintain treatment to i.e., endotracheal intubation, bronchoscopy, open suctioning, direction of nebulized conduct, hand operate airing by intubation, turn-off the patient to the recumbent situation, separating the long-suffering as of the respirator, non-persistent helpful-force ventilation, tracheostomy, also cardiopulmonary revival. Around be a number of evidence COVID-19 infection guide towards intestinal infectivity with survive there inside faeces. There have no information of faecal-oral spread of the COVID-19 illness near time.

### **Covid-19 in India**

The initial cases of COVID-19 in India, be published on January 30, 2020. Because of June 10, 2020, it have approved a entire of 276,583 cases, 135206 improving and 7,745 death within the country. India have the biggest amount of verified belongings breach the 100,000 spot going on mid-May with 200,000 in beginning of June. India's state death rate at 2.80%, upon the global 6.13%, of June 3. Six big cities of all reported cases in the country – Delhi, Mumbai, Ahmedabad, Pune, Kolkata and Chennai.

Scheduled March 22, India acknowledged a 14 hour charitable community curfew on the Prime Minister Narendra Modi. It be accompanied in compulsory lockdown into COVID-19 hotspots with all larger city. Scheduled March 24, the PM well-organized a lockdown

in favour of 21 existence, disturbing the whole population of India. Scheduled April 14, the prime minister continued the countrywide lockdown till beginning of May which last two-week extension initial 3 and 17 May by a few recreations. Inception June the Indian command have happening unlock the nation in three unchain phase.

Michael Ryan, head supervisory leader of the WHO's health dilemma agenda remarked to India have more extra space to contract through the broken chain to its huge information within eradicate smallpox and polio. Former specialists include too advanced care on the financial outcome arise when a effect of virus and defensive limitations.

### **Initiative taken by Indian Government**

The revolution has stated an pandemic in larger than a state and 9 union territory, anywhere prerequisites of the Pandemic Disease Act, 1897 contain be begged, important towards the closing of educational institutes and business-related establishment. The entire traveller visas contain be pending, because the common of the definite cases be mostly imported.

#### **I. Phase 1 (January-February)**

Protecting method was primary implemented in starting of the years. India had started thermal viewing of tourists visiting as of China going on January. Originally included at 7 airport, after a few times later it be consumed to 20 airport moving the ending of I the January. Through February, the thermal showing be long-lasting to tourists starting. The Indian Council of Medical Research (ICMR) revealed to airstrip viewing simply be not inadequate.

#### **II. Phase 2 (March)**

In March, the authority have drained up tactics to contract with pandemic into the country. This combined state with twenty ministry, together with House, Security, Railways, Industry, Majority Affairs, Aviation and Sightseeing, be knowledgeable of the repression plan. The Ministry of Customer Contact, Food and Community Distribution were changed to certify accessibility of fundamentals.

Lying on March 17, the Administration of India announced an optional, drawing towards every Indian state to obtain societal separation method when a anticipatory tactics used for functioning plough 31 March. A management dictate be advertised demanding every Central Armed Police Forces towards find keen on clash form; every non-crucial vacation be dropped.. Government put awake nationwide and state helpline information.



### III. Phase 3 (April)

Over Indian city with lots of state ready wearing face masks compulsory. Scheduled 29 April, The Department of Home Associations declared guiding principle intended for the state to support the interstate transfer of the abandoned people. State contain be claimed to indicate nodal establishment and type contracts to accept with dispatch such individuals. State has to be invited to monitor the individuals, quarantine them, with towards act intermittent fitness check-up.

#### Journey and Entry Margins

Scheduled March 3, 2020, the Indian administration suspended issue of recent visas. Every visa was pending on March 13, apart from tactful with other bureaucrat visa, because fit as the visa-liberated tour designed for Abroad Citizen of India. Indians recurring from COVID pretentious country were expended towards be there quarantined used for 14 days. These dimensions be extended towards society as of Europe, Gulf country with Asian country together with Malaysia on 18 March.

The ground boundary with Myanmar established towards is limited on 9 March among an action of the state government of Mizoram as well as Manipur. On March 13, the management of India blocked tourists travel commencing every bordering country other than Pakistan itself be blocked on March. Tour and booking intended for Sri Kartarpur Sahib were too pending happening this period.

#### Screening

Scheduled on 13th March, the Minister of Health and family welfare, announce the mandatory showing of every global visitors received in India. He besides to because of at that moment, 587,000 persons have moved screen at airport, more individual million screens on boundaries by under community inspection.

#### Closedown and curfews

Beyond the demo, many state over the nation started closing down institutions, school, college, and public department such since malls, gym, movies halls with previous community spaces to enclose the stretch.

#### Lockdown

During protest march, the Indian Government declares a full lockdown in 80 districts in 20 state as well as 9 Union territory of nation anywhere established belongings was recorded. 80 city together with Delhi, Mumbai, Bengaluru, Chennai, Chandigarh and Kolkata be place beneath lockdown. Any state preserved their boundaries excepting inter-state group.

On 24<sup>th</sup> March, Honourable Prime Minister Narendra Modi announces an absolute daylight hour's countrywide lockdown to prevent the coronavirus.

After the deliberation through CMs and administrator of state and UTs lying on 11 April, Prime Minister announce lockdown addition till May 3 and his deal with to country on I April 14, with recreations into area through below extend from April 20 .

On May, the management of India continued countrywide lockdown with two weeks until May 17. On May 17, lockdown till comprehensive 31 May in every state.

On May 30, the ministry declared to the partial lockdown would exist moreover extensive turn over 30 June in repression zones, initial from June 8, in previous zone. It be term the same because "Unlock 1" with be fixed towards "have an economic focus."

#### Review of Literature

Previous studies really helped in gathering data on COVID 19. It is named coronavirus due to its outer layer of envelope proteins appears like crown and it comes under the ambit of RNA viruses (Burrell et al., 2017). They are infective to mammals and birds and can cause mild to severe upper respiratory infections and communicable to a larger human group (Roy et al., 2020). COVID 19 is novel coronavirus which has created havoc in the mind of individuals because no vaccination is available for it. One of the studies suggests that anxiety, depression and stress are very common psychological reactions of COVID-19 pandemic reported by people (Rajkumar, 2020). Addendum to this, anxiety, fear of losing loved ones & death, social distancing, unemployment and homelessness are the stressors that maybe a cause of serious mental illnesses such as depression and anxiety. So, the role of psychiatrists in diagnosing bad short-term effects and preventing the long-term effects on mental health is really valuable (Kavoor, 2020). A long-time isolation from social groups may consequently lead to stress, anxiety, frustration, boredom, depression, and even suicidal idea or attempts (Gunawan et. al, 2020). As due to pandemic, government of India ceased each and every activity announcing lockdown. This decision had a huge a huge impact on each and everything whether it is and individual, group, society, organisation, economy and international relations. Another study on Symptoms of psychological distress and disorder due to social isolation and quarantine reveals general psychological symptoms, emotional disturbance, depression, stress, low mood, irritability, insomnia, post-traumatic stress symptoms, anger, emotional exhaustion stand out as having high prevalence ( Brooks et . al, (2020). Different countries are following different protocols to deal with this pandemic and government should focus on health

infrastructure, more vigilance on social gatherings, Availability of essential commodity, domestic violence, Counselling to reduce panic, Salary deduction and termination in private sectors (Kundu & Bhowmik, 2020). COVID 19 has massive impact on environment also but positive. The cost of the epidemic contain effectively improved the environment to a great extent to must certainly set optimistic crash on global typical weather change (Chakraborty & Matey, 2020). Some researchers are very optimistic about lockdown situation and suggested that measures taken by government should not be taken negatively but instead suggested to take advantage of this situation by self-improvement and making themselves more productive. In response to the problems created by this pandemic, various public health strategies are issued in public interest such as isolation of infected or at-risk persons, reduction of social contact, and simple hygiene like frequent hand wash to reduce the risk of infection (Hiremath et. al ,2020). Corona Worriers are playing a great role during this whole situation by keeping their life at risk. From time to time they guide and counsel people to deal with such kind of situation. Taking mental health into consideration psychiatrist plays an important role in handling with people suffering from anxiety. Few areas of possible intervention by the psychiatrists as per (Banerjee, 2020): Educating about the Common adverse psychological consequences, Encouraging health-promoting behaviours, integrating the available health-care, Facilitate problem-solving, Empowerment of the patients, their families and health-care providers, and Self-care of the health-care providers. Despite of various guidelines issued and welfare measures taken by government (Wolf et. al, 2020) reported to have less awareness about COVID 19 in most vulnerable communities due to low health literacy. With the proliferation in situational awareness in such a public health crisis using formal information sources could apparently increase the adoption of protective health measures and in turn contain the spread of infectious diseases (Qazi et. al, 2020). Almost all the studies reveals that there is significant impact on mental health due to isolation in COVID19 Pandemic. But very few studies reveal about knowledge status of people about Covid-19 in Indian context. Therefore, there is need to study the Knowledge, attitude and perception of Indians towards this pandemic.

### Objectives

- 1) To study the awareness with cooperation level of the people about the COVID-19.
- 2) To study the awareness of social distancing and community screening of COVID-19.

- 3) To assess the attitude and knowledge of rapid response team of COVID-19.

### Research Methodology

Research Design:-Present study is the exploratory and descriptive in nature.

Sample Size: - 100 respondent, which includes peoples, doctors, nurse and other staff members work for the COVID-19.

Sample Area: - Data will be taken by district Sonapat of Haryana.

Data Collection:-For making analysis and interpretation of data, both primary and secondary methods have been used for collection of data:-

1. Primary Data – Conducted online survey from all over Haryana to the questionnaire by Google forms.
2. Secondary Data –Secondary Data collect during:- Web Sites, Journal and Newspapers

### Data Analysis

1. Awareness and Cooperation Level

Table 1:- Age Group of respondents

Age	Responses
0-17	8
18-35	53
36-58	34
59-70	7
71 and above	4
Total	100

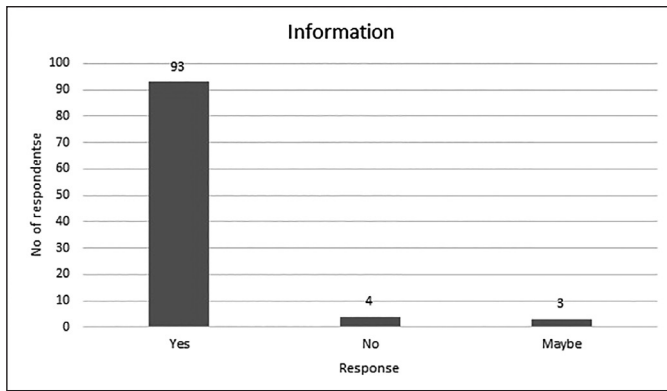
Above Table No.1 represents that maximum number of respondents are from the age group of 18-35 and 36-58 years that is 87% and the least respondent are 4% from the age group of 71 and above.

Table 2:- Gender

Gender	Responses
Male	36
Female	64
Total	100

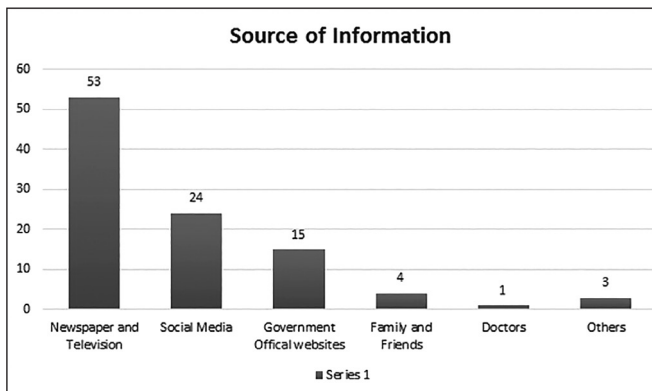
Above Table no. 2 showing maximum respondents are female and their ratio is 64% where only 36% are male.

**Table 3:- Have sufficient information about COVID 19.**



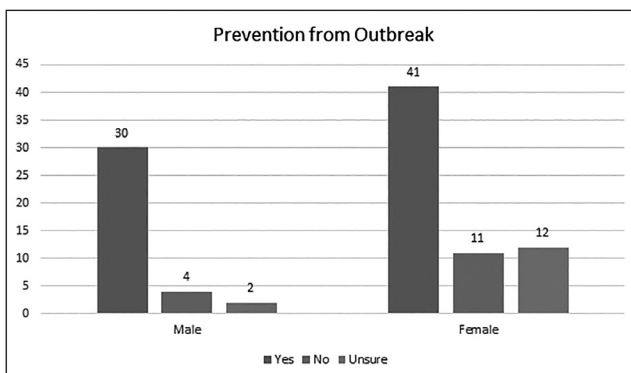
As per Table no. 3 maximum number of respondents have almost every information about COVID-19. Rest are aware but not sure about whether they have sufficient information or not.

**Table 4:- Main Source of Information regarding of COVID-19.**



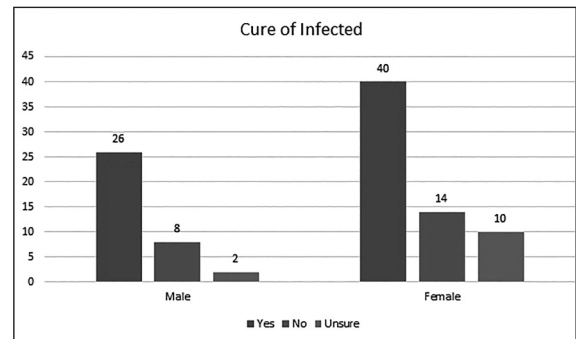
Analysis of above Table No.4 clearly shows that print media is the main source of information regarding Covid-19 that is 53% because Newspapers and televisions gives more reliable information about Covid-19 than any other source.

**Table 5:- Health Department is doing enough to prevent the outbreak from spreading**



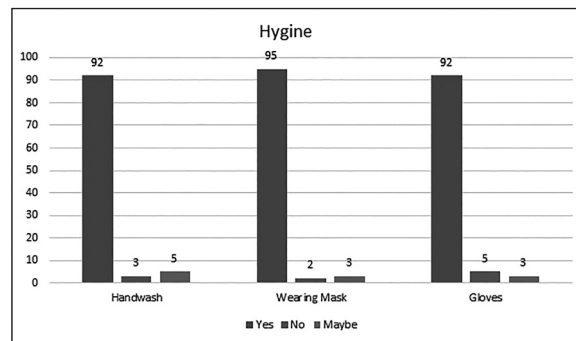
From the analysis above Table No.5 shows that maximum 71% respondent think that the health department doing better to prevent the outbreak of Covid-19. 71%(30% and 41%) male and female are agree and 15% they think health department is not provide proper treatment and medicine.

**Table 6:- Health department is doing enough to cure Infected**



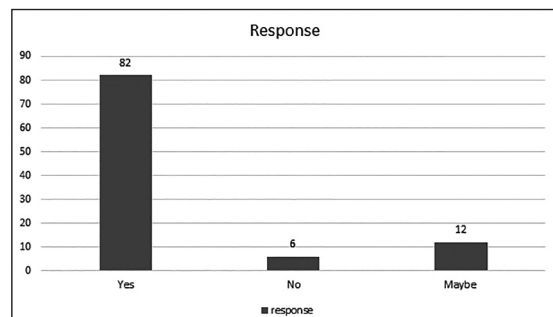
From the above Table no. 6 it has been seen that maximum 66% people believe that government is doing well to cure infected one.

**Table 7:- Hygiene is important in preventing the spread of the Covid-19.**



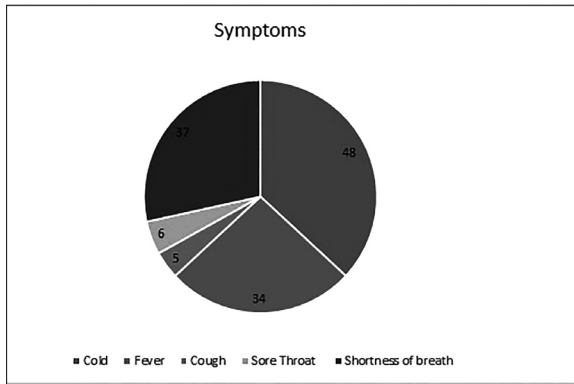
From the above table no. 7 it has been seen that maximum number of respondents believe that hand wash, Wearing mask and Gloves are really helpful in preventing the spread of COVID 19.

**Table 8:- COVID-19 be cured with antibiotics**



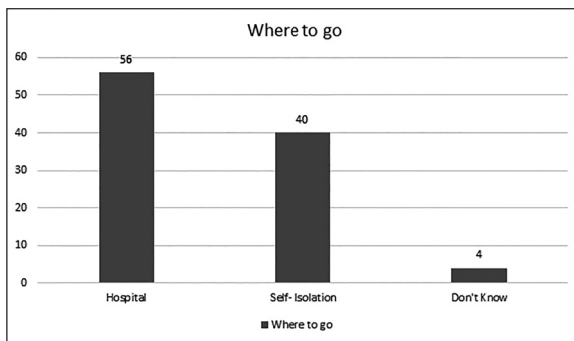
Since, No medicine available to cure COVID 19. Almost 82% people believe that antibiotics will be helpful in treating COVID-19.

**Table 9:- Main symptoms of the Virus**



Since many initiatives taken by government to spread awareness regarding COVID19. So, lot of people know what are the symptoms common and severe.

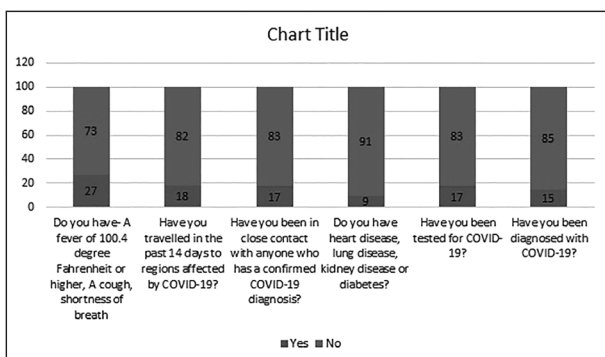
**Table 10:- Where to go if you start developing symptoms**



From the above table it can be seen that many people prefer to visit hospital but preference given by respondents to self-isolation can't be ignored.

**2. Social Distancing and Screening**

**Table 11:-**

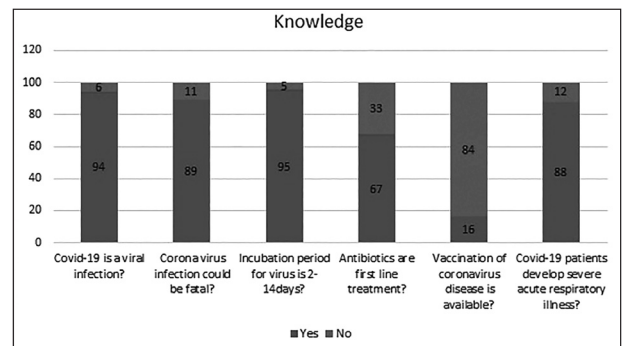


From the above table No.11 of screening it can be seen that 27% people encounter fever more than 100.4 Fahrenheit. 18% people travelled in COVID affected region. 17% respondents confirmed that they have been in close contact with someone diagnosed with COVID 19. 9% respondents have heart, lungs, kidney disease and diabetes. 17% tested for COVID19 and 15% diagnosed.

**3. Knowledge**

**Table 12:-**

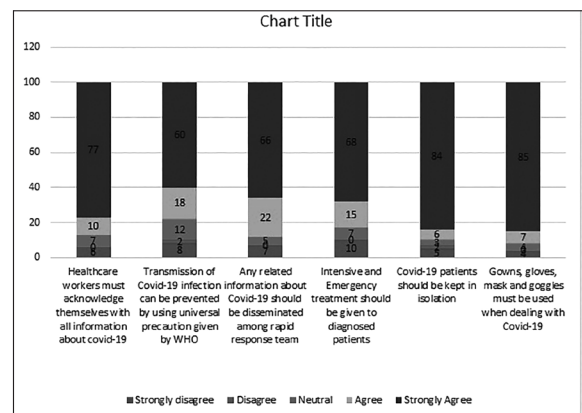
Statements	Yes	No
Covid-19 is a viral infection?	94	6
Corona virus infection could be fatal?	89	11
Incubation period for this virus is 2-14days?	95	5
Antibiotics are first line treatment?	67	33
Vaccination of coronavirus disease is available?	16	84
Covid-19 patients develop severe acute respiratory illness?	88	12



From the above table no. 12 it has been observed that maximum number of respondents are having correct knowledge on COVID 19.

**4. Attitude**

**Table 13:-**





Almost all respondents strongly agree on the statement related to attitude of healthcare staff.

### Conclusion

1. To measure the participation awareness and cooperation level of the people about Covid-19, questions set on the age, gender, heard about the corona virus, Main source of information, Health department is doing enough to cure infected, Hand hygiene, wearing a mask and gloves, it cured with antibiotics, main symptoms of corona virus and where to go if you start developing symptoms.
2. A total of 100 participant have completed the survey, In terms of age group 53% belongs to the age group 18 to 35, and 34% respondents belongs to the age group 36 to 58. The age group above 71 are least respondents.
3. While in terms of gender, 64% of the respondent were female and 36% were male. The 93% respondents reported that they have sufficient information about COVID-19. Moreover, Newspaper and television are the main source of information.
4. More than half of the respondents were 71% think that health department is doing enough to prevent the spread of Corona Virus.
5. 61% respondents are agree and think that health department is doing enough to cure infected. 92% respondents are agree to hand over hygiene is significant in prevent the spread of corona virus.
6. 95% respondent are aware of wearing a mask help prevent the spread of corona virus and 92% respondent are agree to wearing gloves help prevent the virus.
7. 82% respondents are believed that antibiotics are the best medicine to cure with corona virus.
8. Covid-19 may cause a range of symptoms, as almost all the respondents know that cold 48%, fever 34%, shortness of breath 37%, sore throat 6% and cough 5%. While 96% respondents are know where to go if symptoms are developed.
9. In screening 73% respondent have not any type of symptoms during screening. 82% respondent are not travelled in the past 14days. 83% respondent are not come to close contact with anyone who has confirmed Covid-19, While 91% respondents are not affected by any disease. 83% respondent are have not tested, while 85% respondent are not diagnosed with Covid-19.
10. Knowledge and attitude – To assess the attitude and knowledge of rapid response team of Covid-19, 94% respondent are thought that Corona Virus is a viral infection and they have proper knowledge of

Covid-19. While 89% respondent are thought that the corona virus could be fatal. 95% respondent are thought that incubation period for this virus is 2-14 days. In our study, 67% respondent are thought that antibiotics are must as first line of treatment. The majority of the respondent 84% are agreed that vaccination of corona virus is available and 88% respondent are agreed that Covid-19 patient develop severe acute respiratory illness.

11. In attitude, over 77% of the respondent were in favour of them all information about Covid-19. 60% respondent are agree that conduction of COVID-19 illness be able to exist prohibited by means of worldwide precaution specified by WHO.
12. 66% respondent are agreed that they linked information regarding Covid-19 should be disseminated among rapid response team, 68% respondent are agreed that intensive care and emergency treatment should be given to diagnosed patients. 84% respondents are agreed that Covid-19 patients should be kept at Isolation place and 85% respondents agreed that gowns, gloves, Facemask and goggles must be used when dealing with Covid-19 patients.

### Suggestions

1. Clean hand through soap, alcohol-based sanitizer.
2. Cover up nose, oral cavity at the same time as sneezing or coughing through mask or tissue and disposed it directly followed by wash hand and sanitize hands.
3. Perform not touch features, oral cavity, eyes through hand following moving anything on community place.
4. Continue social distancing and keep away from roaming under the street and meeting information on the street and crowd in groups. This is the greatest way to stop the spread of Covid-19.
5. It is suggested that people stay at home as much as possible, going out only for critical needs like groceries and medicine.
6. Consume well, use at residence and keep good immunity level to battle alongside Corona virus.
7. Track the guiding principle recommended by nation head and WHO.
8. Consumption of Warm water, garlic, ginger, turmeric powder, Tulsi leaves, Giloy Juice on daily basis will make our immunity strong.
9. Doctors and Government should advertise more about use of yoga and Ayurveda for prevention of corona.

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# The COVID-19 Crisis and the Way Forward for a Self-Reliant India

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## Abstract

*The outbreak of COVID-19 followed by the phases of lockdown has caused a severely disruptive impact on both demand and supply-side elements which have the potential to derail India's growth story. However, India has tackled the situation with fortitude and a spirit of self-reliance. This pandemic has virtually opened immense opportunities for Indian products and services to reach out to the world. In this respect, the present study attempts to look into the Atmanirbhar Bharat Abhiyaan and Skill India Mission in the light of the Endogenous Growth Model and the New Growth Theory. The field of economic growth has reawakened with the emergence of the Endogenous Growth theory; long-run growth has gained prominence than short-run fluctuations. Given the current demographic profile of the country, the paper tries to justify that these initiatives taken by the Government of India can be the way forward for self-reliant, sustainable, and long-run economic growth of India.*

**Keywords:** Covid-19, Lockdown, Atmanirbhar Bharat Abhiyaan, Skill India Mission, Endogenous Growth, New Growth Theory.

## Introduction

Economic growth has the power to transform societies, boost incomes, and help citizens thrive, but growth alone is not enough. To reduce poverty and ensure shared prosperity, growth needs to create more, better, and inclusive jobs. Improving financial access, strengthening skills training, supporting a strong private sector, and building sustainable infrastructure all connect people to job opportunities that can help end extreme poverty in the poorest countries (World Bank Annual Report 2019). While economic growth is an important tool for improving living conditions, to ensure the reach and impact of the benefits of growth for the common man, the role of state along with its various institutions is vital. The outbreak of COVID-19 followed by the phases of lockdown has caused a severely disruptive impact on both demand and supply-side elements which have the potential to derail India's growth story. However, India has tackled the situation with fortitude and a spirit of self-reliance.

## Objective of the Study

This pandemic has virtually opened immense opportunities for Indian products and services to reach

out to the world. In this respect, the present study attempts to look into the Atmanirbhar Bharat Abhiyaan and Skill India Mission in the light of the Endogenous Growth Model and the New Growth Theory. Given the current demographic profile of the country, the paper tries to justify that these initiatives taken by the Government of India can be the way forward for self-reliant, sustainable, and long-run economic growth of India.

## Literature Review

Traditionally, economic theory emphasised physical capital to be the main determinant of growth in the short-run with exogenous technical progress being the long-run source of growth. Attempts to make the long-run determinant of growth endogenous rather than exogenous, since the mid-1980s, experienced a new boom, beginning with the work of Romer (1986) and Lucas(1988). In these models growth may go on indefinitely because returns to investment in a broad class of capital goods - which includes human capital - do not necessarily diminish as economies develop. Spillovers of knowledge across producers and external benefits from human capital are parts of this process; they help avoid

the tendency of diminishing returns associated with accumulation of physical capital. Developing countries' economic experience had an important role in the rise of New Growth Theories (Islam, 2004). The New Growth Theories, by emphasizing the role of institutions have brought growth theory closer to development theory. Eicher and Leukert (2009), Lee and Kim (2009) have confirmed in their work the importance of institutions during the early stages of economic development.

There is a growing body of empirical literature on the magnitude of the contribution of various factors to fostering growth of India. Mallick (2001,2002), Self and Grabowski (2004) confirm that the human-capital accumulation is more relevant for economic growth in India. Using time series data, Haldar (2009), Bhattacharjee and Haldar (2011), Bhattacharjee and Haldar (2014) have observed that human capital accumulation led growth is more crucial for the Indian economy. Using time series data, Marjit and Raychaudhuri (1997) and Sarkar (2007) have found that there has been no export-led growth in India; rather it is growth-driven exports. Love and Chandra (2004) have used cointegration technique to show that aggregate investment does not affect growth in income rather openness (measured by openness index) positively affects the income growth in India. Using panel data, Bhattacharjee and Haldar (2015a, 2015b) have confirmed that institutional quality needs to be improved for sustainability of economic growth of the major South Asian economies. Using time series data, Bhattacharjee (2016) has observed that though institutional quality does not have significant influence on economic growth of India, but the speed of adjustment diminishes when institutional quality is incorporated. Hence, the quality of institution deserves attention to sustain economic growth of the country.

The Covid-19 has brought untold miseries to a large section of low income households in the country. The government has come forward with economic packages to transfer income to the poorer segments in the economy along with complementary liquidity enhancing measures of monetary authority. Though these are necessary steps in the right direction, but these measures if allowed to go on indefinitely will land the country into another crisis. Long term strategies must be taken up keeping the national as well as the global reality in mind. Given that the origin of the crisis was from China, major manufacturing nations of the world have given signals to diversify the sourcing for global value chains. In this direction, Raychaudhuri (2020) has stressed on the golden opportunities India can tap in the context of global value chains. Ghosh (2020) has also highlighted the changing global economic order that has created huge opportunities for India. He has suggested

that India must focus on the Sustainable Development Goals which are embedded in one form of capital or the other. Mandal (2020) has recommended to encourage virtual trade in services and increase public investment to capitalize on the recent turn of events of the USA-China trade war. Mandal (2020) has also laid stress to improve the health infrastructure of the country. Francis (2020) advocates that the Government of India must use multiple innovation challenges and research grants in emerging technologies to incentivize the development of new indigenous solutions and products that incorporate domestic design/software/local data analytics. The post-Covid-19 world places India at an advantageous position to capitalize on the sustained global demand for electrical machinery. Banerjee (2020) points out that India must encourage domestic manufacturers to expand capacities, venture into new geographies and reach out to global manufacturers, making India an attractive destination of investment. Badri (2020) has also pointed to the opportunity offered by the Covid-19 crisis for India to evolve as a major exporting hub for manufactured goods. Nag (2020) has emphasised that skill development and issues related to product, process and design innovation should be enhanced through SME initiatives. Appreciating the policy decisions and the government's first response on addressing the immediate imperatives, Kapur and Subramanian (2020) have pointed out on the opportunity to do things that are not only good for now but for the medium term as well. The present study tries to explore the link between the recent policy initiatives, namely, the Atmanirbhar Bharat Abhiyaan and Skill India Mission and the Endogenous Growth Model and New Growth Theory.

### **Data and Methodology**

Annual data on per capita Gross Domestic Product (PCGDP), physical capital stock and openness are from Penn World Tables for the period 1960 to 2014. We have used mean years of schooling (MYS) to proxy for human capital stock; MYS is the number of years of schooling received per person aged 15 and above. Barro and Lee data sets have been used, which provide five-yearly data on MYS; we have interpolated for the interim years and extrapolated for the period 2011 to 2014, assuming exponential smoothing. We use Jagers and Marshall's (2000) Polity IV Project. This project provides the longest time series data on measures of institutions. The Polity score is calculated by subtracting the AUTOC score from the DEMOC score, the resulting unified polity scale ranges from -10 (strongly autocratic or hereditary monarchy) to +10 (strongly democratic). The data have been re-scaled (11+ POLITY score) so that all scores are positive, from 1 (strongly autocratic) to 21 (strongly democratic). The variable on constraints on



the executives refers to the extent of institutionalized constraints in the decision-making power of chief executives, whether as individuals or a collective. This is similar to the 'horizontal accountability' found in the democracy literature but it assumes that dictators may also be bound by certain institutional constraints. The degree of checks and balances between the various parts of the government is coded on a 7-point scale which ranges from "unlimited executive authority" (1) to "executive parity or subordination" (7).

Since most macroeconomic time series data are non-stationary in nature, it is known that applying OLS to non-stationary series leads to spurious correlations and erroneous conclusions. I employ the Ordinary

Least Squares (OLS)-based Auto Regressive Distributed Lag (ARDL) approach to estimate the determinants of economic growth of the India in the long-run. In small or finite sample data sizes the Autoregressive Distributive Lag (ARDL) process is relatively more efficient.

### Estimation

India has experienced rapid growth spur since the early 1990s. According to World Bank estimates real GDP grew at an annual average rate of 6 per cent in India during the last two decades. I have done a time series analysis on India from 1960-2014.

Table 1 below gives the descriptive statistics of the variables under study.

**Table 1: Summary Statistics**

	PCGDP	PCK	OPEN	MYS	POLITY	XCONST
Mean	1960.66	2840.75	23.62	3.71	19.57	6.96
Maximum	4584.73	7471.78	51.75	6.32	20	7
Minimum	949.16	1496.76	11.91	1.53	18	6
SD	937.44	1444.43	11.92	1.38	0.57	0.20
Skewness	1.16	2.02	1.069	0.19	-0.94	-4.49
Kurtosis	3.53	3.32	2.71	1.88	-0.07	22.83
Observations	54	54	54	54	54	54

Source: Author's calculations

In order to test for structural change over time in India, I have resorted to the two tests, CUSUM and CUSUMQ tests (not shown to save on space). The test results are robust, there is no structural break as the cumulative sum of residuals and squared residuals fall within the critical bounds at 5 per cent significance level. Stationarity of the variables have been tested using ADF and PP tests as shown in Table 2. Most of the variables are I (0) at first differences.

**Table 2: Unit root tests**

	ADF				PP			
	Level		1 <sup>st</sup> Difference		Level		1 <sup>st</sup> Difference	
	C	C & T	C	C & T	C	C & T	C	C & T
lnPCGDP	2.94(1)	0.42(1)	-5.61***(1)	-6.44***(1)	4.65(11)	1.55(10)	-5.61***(0)	-6.55***(9)
ln PCK	-2.06(1)	-1.58(1)	-3.96***(1)	-4.18***(1)	1.44(5)	0.32(4)	-2.23(0)	-2.75(0)
lnOPEN	1.33(1)	-1.82(1)	-5.66***(1)	-6.26***(1)	0.95(3)	-1.82(1)	-5.74***(3)	-6.27***(1)
lnMYS	-2.00 (3)	-1.76(2)	-18.1***(5)	-18.2***(2)	-2.97(3)	-3.44***(3)	-11.2***(5)	-11.86***(4)
POLITY	-2.20(0)	-2.22(0)	-6.7***(1)	-6.8***(1)	-2.25(2)	-2.11(3)	-7.3***(8)	-7.93***(9)
XCONST	-5***(1)	-5.1***(1)	-8.21***(1)	-8.12***(1)	-3.9***(6)	-3.83***(6)	-6.85***(5)	-17.39***(7)

Source: Author's calculations

Notes: \*, \*\*, \*\*\* indicate significance at 10%, 5% and 1% levels respectively. For ADF test, number within parentheses indicates optimum lag determined according to AIC criterion.

I apply OLS based ARDL approach to cointegration. Based on the F-statistics I can conclude that  $\ln\text{PCGDP}$  has a long-run relationship with the explanatory variables and that they move together. Therefore I can now apply the ARDL method to cointegration to estimate the long-term coefficients and ECM. The optimal lag length has been selected using the AIC criterion.

$$\ln\text{PCGDP} = -0.12 + 0.20\ln\text{PCK} + 0.50\ln\text{OPEN} + 0.84\ln\text{MYS} - 0.12\text{Dopen} - 0.06\text{Polity} + 0.10\text{Xconst}$$

$$\begin{array}{cccccc} \text{p-values} & (0.34) & (0.05) & (0.10) & (0.01) & (0.34) \\ & (0.34) & (0.39) & & & \end{array} \dots(1)$$

$$d\ln\text{PCGDP}_t = 0.64 + 0.03d\ln\text{PCK} - 0.11d\ln\text{OPEN} + 0.13d\ln\text{MYS} - 0.01\text{Polity} + 0.02dx\text{const}$$

$$\begin{array}{cccccc} \text{p-values} & (0.09) & (0.22) & (0.12) & (0.12) & \\ & (0.32) & (0.45) & & & \end{array}$$

$$-0.02d\text{Dopen} - 0.15\text{ECM}_{t-1} \quad (0.29) \quad (0.09) \dots(2)$$

Equation (1) shows that in the long-run human capital is the key determinant of economic growth followed by physical capital and OPENNESS. The coefficient of Dopen is found to be negative but insignificant in the long run. The institutional variables are insignificant during the period. The intercept term is insignificant, implying that the variables included in the model

explain long-run empirics. The findings of the study are in line with those of Marjit and Raychaudhuri (1997), Sarkar (2007), Haldar (2009), Bhattacharjee and Haldar (2011), Bhattacharjee and Haldar (2014).

Now, for the short-run dynamics, I consider the error correction model in equation (2). In short-run, I find the error correction term is correctly signed and significant at 9 percent. However, no significant influence of the explanatory variables is observed in the short run.

No significant influence of institutional measures is observed either in the long run or in the short run. Though weak institutional quality has not negatively influenced economic growth of the country but to sustain high growth, major institutional reforms is the need of the hour. Various institutional reforms have been initiated since 2014, Aadhaar Linked Payments (ALP) system which leveraged the Jan Dhan, Aadhaar and Mobile (JAM) trinity to provide Direct Benefit Transfers (DBT) to the beneficiary accounts, stringent asset quality review introduced by Reserve Bank of India (RBI) in 2015, Goods and Services Tax (GST) reforms introduced

in 2016 and many more which are expected to improve the institutional quality of the country and hence lead to a sustainable economic growth in the long run.

### Policy Recommendations

Based on my study period and data, I conclude that endogenous growth theory emphasizing the importance of human capital is more relevant for the Indian economy. Physical capital is the other important growth enhancing variable for the country. The coefficient of OPENNESS is significant at 10 percent level. If OPENNESS has to affect growth via total factor productivity, the country should have rich human capital because without proper training and skills, technology adaptation will be inadequate resulting in slower growth. So, the country should provide for skills training, develop adequate physical capital by investing in infrastructure development and improve institutional quality. Digitization should be promoted in every sphere of life and proper training should be imparted to reduce the existing digital division among the rural and urban masses. The various online trainings and workshops on e-content development by Ministry of Human Resource Development (MHRD), University Grants Commission (UGC) and other educational institutions deserve special attention in this respect. Technology driven education system is the need of the hour and initiatives like PM e-Vidya, Manodarpan, SWAYAM, epg-pathshala, etc. should be encouraged to help the students at the farthest corner of the country with the state-of-the-art knowledge. The National Education Policy 2020 recognizing the importance of human capital accumulation and skill development has encouraged universalization of Early Childhood Care Education, vocational integration from Class VI, e-learning in regional language, digitally equipping schools, teachers and students. Government also needs to take initiative to provide better network connectivity and cheaper data in this crisis laden period to make Digital India, a success story. The Government needs to gear up Financial Literacy programmes in online mode to speed up financial inclusion. These initiatives can make the policy initiatives more inclusive in nature.

Atmanirbhar Bharat and Skill India Mission are the two initiatives taken by the Government of India in this direction. Atmanirbhar Bharat emphasizes Fast track Investment Clearance through Empowered Group of Secretaries (EGoS), introduction of Commercial Mining in Coal Sector to reduce import of substitutable coal and increase self-reliance in coal production, enhance self-reliance in defence production, 'Make in India' for self-reliance in defence production. India's robust start-up ecosystem is also proposed to be linked to nuclear sector. The Mahatma Gandhi National Rural Employment

Guarantee Scheme (MGNREGS) which came into effect from February 2, 2006 had been saddled with several inefficiencies (Niehaus and Sukhtankar, 2013; Ravallion, 2012; Agarwal et al., 2016). The programme was reviewed in 2015 and the government initiated major reforms using technology, the scheme was also integrated with the Aadhaar Linked Payments (ALP) system. The ALP leveraged the JAM trinity to provide Direct Benefit Transfers (DBT) to the beneficiary accounts. As a result, the wage payment system underlying MGNREGS was streamlined, thereby reducing the scope for delays in payment (Agarwal et al., 2019). Attempts must be made to complete the JAM trinity not only to enhance cash transfers, but also to empower citizens. Bhattacharjee (2020) has stressed the need to make financial inclusion effective for the masses. The crisis should be the opportunity to go on war footing to do intelligent industrial policy — incentives, regulatory help, trade policy — that would resurrect India's manufacturing capability and thereby replace China in the production of the essential Active Pharmaceutical Ingredients (API) used to manufacture drugs. Reforms have been made to improve governance for Ease of Doing Business. Sustained measures taken have resulted in steadily improving India's position in World Bank's Doing Business Report rank from 142 in 2014 to 63 in 2019. Government is working on a mission mode on the next phase of Ease of Doing Business Reforms relating to easy registration of property, fast disposal of commercial disputes and simpler tax regime for making India one of the easiest places to do business. Indian MSMEs and other companies have often faced unfair competition from foreign companies. Therefore, global tenders will be disallowed in Government procurement tenders upto Rs 200 crores. Necessary amendments of General Financial Rules will be affected. This will be a step towards Self-Reliant India and support Make in India. This will also help MSMEs to increase their business. Minimum threshold to initiate insolvency proceedings has been raised to Rs. 1 crore (from Rs. 1 lakh, which largely insulates MSMEs). Special insolvency resolution framework for MSMEs under Section 240A of the Code will be notified soon. 'Atmanirbhar Bharat' stresses on a self-reliant economy. If domestic production indeed displaces imports, it also creates jobs and possibly increases national income. This initiative may reap benefits after a few years, though will be laden with initial teething problems. However, attempt must be made to develop a self-reliant, efficient and competitive economy. It is further recommended to develop alternative sources of supply of crucial inputs to protect the country from any further disruptions in supply chains arising out of external threats.

India is a country today with 65% of its youth in the working age group. If ever there is a way to reap this

demographic advantage, it has to be through skill development of the youth so that they add not only to their personal growth, but to the country's economic growth as well. Pradhan Mantri Kaushal Vikas Yojana (PMKVY) is the flagship scheme of the Ministry of Skill Development & Entrepreneurship (MSDE). The objective of this Skill Certification Scheme is to enable a large number of Indian youth to take up industry-relevant skill training that will help them in securing a better livelihood. Individuals with prior learning experience or skills will also be assessed and certified under Recognition of Prior Learning (RPL). Under this Scheme, Training and Assessment fees are completely paid by the Government. The present crisis is a wake-up call to address India's severe limitations in the provision of basic health.

### Conclusion

Warnings about the deep import dependency of India's pharmaceutical and electronics industries

(including computing and telecommunications equipment, medical equipment, etc.), particularly on China, have been made by observers for several years now. The current crisis should serve as a wakeup call for policymakers. Simultaneously, end-user demand for indigenous products must be expanded on an urgent basis through government procurement. For this to work, the Preference for Make-in-India policy must be implemented in letter and spirit, discarding any built-in bias against indigenously developed products and services. The post-COVID-19 world places India at an advantageous position to capitalize on the expected sustained global demand for electrical machinery. India must encourage domestic manufacturers to expand capacities, venture into new geographies and reach out to global manufacturers, making it attractive for them to invest in the country. This will help in inclusion of India in the global value chains. We need to turn the challenges into opportunities. While many institutional reforms are already underway since 2014, however, speedier implementation of the various projects needs to be undertaken to tackle the present crisis. Also, investment in human capital formation, physical infrastructure and skills training through various schemes should be accelerated to grab the opportunities thrown open to India by this global pandemic. The Atmanirbhar Bharat and Skill India Mission can be way forward for India in the long run.

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# A Study on Performance of Indian States on Targeting the Dual Burden of Malnutrition Among women

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## **Abstract**

*While there is a decline in percentage of under nutrition among women in India but we also witness a rising trend in obesity across states. Thus the overall nutritional status of women is far from satisfactory and there is a long way to go to achieve the nutritional targets. This paper attempts to examine the dual burden of malnutrition and the trends in malnutrition among women. The latest government data NFHS 4 is analyzed to see if there is improvement in nutritional indicators among women and its possible factors. There is a huge variation in proportion of malnourishment among women across states. The relative performances of states in targeting malnutrition among women have been mixed. Undernourishment is higher among rural whereas overweight/obesity is more among urban woman. Data reveals an improvement in socio economic factors that are expected to be related to woman nutritional status over the period from 2005-06 to 2015-16. However the improvement is not large and leaves a scope for increase in access and reach out to basic health services and nutritional wellbeing of women.*

**Keywords:** *Under Nutrition, Over-Weight, Obesity, Women, India*

## **Introduction**

Malnutrition is a dual problem that either results in under nutrition or obesity /overweight. The second form of malnutrition is less studied and the research in this area is emerging in the recent past only with growing obesity across the world. Often malnutrition is understood as lack of nutrients that ill affects the individuals' health and is taken as synonym to under nutrition. It is a result of a set of nutritional related deficiencies and lead to spectrum of disorders related to nutritional deficiencies. It causes iodine deficiency disorders like hypothyroidism, Goiter, Protein energy malnutrition, affects the eyesight as a result of vitamin A deficiency, iron deficiency anemia, compromised immune function and results in many other non- communicable diseases such as osteoporosis, week digestive system and also results in fetal growth retardation in pregnant women.

Malnutrition in adults are usually measured using anthropometric indicators like Body mass index (BMI).

BMI is expressed as weight in kilograms by height in meters (WHO, 2005).The BMI less than 18.5 for an adult indicates malnutrition. A BMI greater than 25 kg/m<sup>2</sup> reflects over nutrition/overweight and a BMI of 30 kg/m<sup>2</sup> and above reflects obesity (CDCP, 2005). Most studies (Bailey & Luzzi, 1995; Girma & Genebo,2002; F. Haseen, 2010) have used Body mass index (BMI) as an indicator of adult malnutrition.

Malnutrition status of women is very important because it is through women and her children that the effect of malnutrition is propagated to future generation. A malnourished mother gives birth to a low weight child who is more prone to diseases and negatively effects the future economic growth and development of the family and the society and continues the vicious circle of poverty and malnourishment.

Ramchandran (2008) analyzed the data trends from National Family Health Survey NFHS 2, NFHS 3 and National Nutrition Monitoring Bureau (NNMB) on

nutritional status of adults and pointed out the trends in increased obesity in India. Malnutrition effects on women and adolescent girls have been long recognized but not much has been achieved with respect to improvement in addressing their specific nutritional problems (Ransom, E., et al., 2003). Ramesh, P. (2008) in his study on malnutrition among women in Kerala found that overweight and obesity among women is showing an increasing trend.

Women are at greater risk of malnourishment. Studies have shown that among adults women malnutrition rates are higher than males especially in certain areas like Latin America, South/Southeast Asia and Sub-Saharan Africa (Nube et al. 2003; Ransom, E., et al. (2003)). A study confirms that every 1 out of 3 pregnant women is malnourished in India (UNICEF, 2018). As we talk about gender equality, equal rights and opportunity it seems important to highlight the facts related to women health especially for a diverse country like India where the women today is working hard towards achieving her dreams and contribute to the society and the economy to her full capacity. The Indian scenario though have shown decline in the percentage of malnourished women over the years but we witness a equal rise in obesity among them (NFHS 3; NFHS4). Thus there remains a lot of scope for further improvement

This study begins with analysis of health and nutritional status of women in India and will also identify the pattern across states. The focus will be on key factors related to women health and nutritional status. The results would give an insight on overall health scenario of India, further across states and rural urban divide. A comparison of these key indicators will be made between NFHS 3 and NFHS 4 which will thus highlight the pattern and change in the health scenario over this span. The analysis is based on data on NFHS-4 (2015-16) which covers health dimensions of women age 15 to 49 years across India.

According to NFHS 4, In India 23.9 percent of women suffers from under nutrition and more than 50 percent of all women age 15-49 years are anaemic in 2015-16 which is marginally low (2.2 percent) than what it was in 2005-06. Approximately 7 percent of women age 15-49 years suffers from hypertension for which the percentage in urban areas (7.3 percent) is higher than that in rural areas (6.5 percent). The data on BMI reveals the increasing double burden of malnutrition among women in India. 20.6 percent of women population is obese in 2015-16 as compared to 14.8 percent in 2005-06. The problem is much intense in urban areas. On the other hand we witness a fall in under nutrition among women from more than 30 percent to 22.9 percent in 2015-16.

### Double burden of malnutrition among women in India

We now look at the nutritional status of women in India (Figure 3). The nutritional status of adults is measured by his/

her BMI. A BMI below 18.5 Kg/m<sup>2</sup> reflects undernourishment and a BMI greater than 25 kg/m<sup>2</sup> reflects obesity. The latest NFHS 4 data clearly shows that today India suffers from the dual burden of malnutrition where there coexists undernourished with over nourished or obese population. Figure 1 clearly suggests the percentage of obesity among women has remarkably increased from 14.8 percent in 2005-06 to 20.6 percent in 2015-16 and the increase is witnessed in urban as well as rural India. This definitely points out the problem which is recently emerging and requires attention from the researchers and the policy makers. On the other hand there is a fall in the percentage of undernourished women from 33 percent to 22.9 percent between 2005-06 to 2015-16, the fall is witnessed in both rural and urban areas. We in India today is witnessing the dual burden where there exist large percentage of undernourished women 22.9 percent of which 26.7 percent of rural and 15.5 percent of urban women is undernourished along with equal percentage of obese women population (20.6 percent). It is important to notice here that a large chunk of urban women is obese (31.3 percent) as compared to rural area (15 percent). On the other hand undernourishment is greater among rural than urban women. 26.7 percent of rural women is malnourished against 15.5 percent of urban. This makes us conclude that the intensity of the problem of obesity is relatively higher in urban areas and that of under nutrition is higher in rural areas.

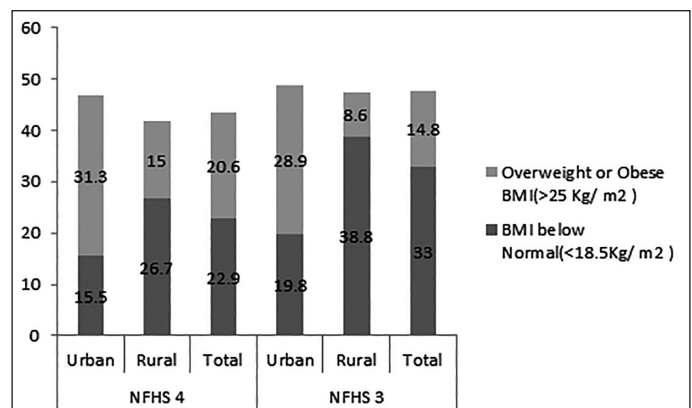


Figure 1: Malnutrition among Women in India in 2015-16 and 2005-06

Source: NFHS 4

Another silent health problem that most of the women in India are facing is Anaemia. It is found to be present in large proportion among undernourished as well as obese women. It measures lack of iron which is one of the most important nutrients for a healthy body. Malnourishment among women as measured by anaemia is present in both urban and rural India and need to be addressed independently as it cannot be solely attributed to income inequality. See Figure 2 where a large proportion of



urban (51percent) and rural (54.4percent) non pregnant women age 15-49 years are anaemic. The scenario is somewhat similar in case of pregnant women for which the figures are (45.8percent) urban and (52.2 percent) rural. It is slightly higher in rural areas against urban area. The percentage of women with anaemia have showed a marginal decline when we compare the figures of NFHS 4 and NFHS 3, it has fallen from 56.2percent to 53.2percent among non-pregnant women and witnessed a fall of around 7.5 percent from 57.9percent to 50.4percent among pregnant women. This fall cannot be taken as satisfactory and requires the attention from health professionals and researchers in this area to target the problem effectively and look for possible solutions through integrated policy framework which aims to promote healthy life and a healthy lifestyle.

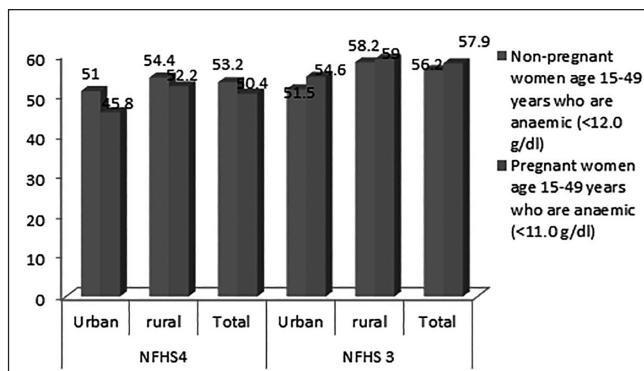


Figure 2: Anaemia among Indian women - Rural Urban Scenario in 2015-16 and 2005-06

Source NFHS 4 and NFHS 3

### Trends and Levels of Key socio economic factors related to Women Health in India

We now analyze the data (Table 1) on level and trends on some selected key economic and social factors related to women health and nutritional status. The women health in India is in a bad state even though the data reveals slight improvement in some key indicators of women health and nutritional status. We now analyze the socio economic factors that are expected to influence nutritional status directly. There is little improvement over the two periods of NFHS 3(2005-06) and NFHS 4(2015-16). For instance, female population above 6 years of age who ever attended school increased from 58.3 percent in 2005-06 to 68.8 percent in 2015-16. There is also an increase in percentage of women with 10 or more years of schooling but still only one third of women population have 10 or more years of schooling experience. This reflects the lack of accessibility to education in true sense to a larger proportion of the total population of our country. The relationship between health and education is proven by many studies (Ransom, E., etal. (2003) ;

Kishor, S. & K. Gupta (2009); Hingorani, B. (2014)) and thus we felt a need for larger reforms in education, especially women education because it will create ripple effects in diverse areas including health which will thus impact the economic growth and development of our country. Factors related to women empowerment have shown improvement over the period. One of the factors which has shown a major change is a large increase in percentage of women having a bank account which they themselves operate to 53 percent from 15 percent in 2005-06. This suggests the impact of the government initiative on digitalization of the economy and schemes like Pradhan Mantri Jan Dhan Yojna which certainly have resulted in such massive increase in the percentage of women holding bank accounts. The increase has been witnessed in both urban and rural areas. Other indicators like spousal violence have also shown a decline over the period but is more widespread in rural areas (34.1 percent ) as compare to urban areas (25.3 percent). More than 80 percent of women (both rural and urban) accepted that they participate in household decision making as oppose to approximately 75 percent in 2004-06. Thus the women empowerment indicators definitely have shown improvement over the years and can be accepted as important socio economic factors that adds to the explanation of falling under nutrition among women over this period.

Table 1 Key Socio Economic Factors Related To Women Health: 2015-16 and 2005-06

Indicators	Urban	Rural	NFHS 4 Total	NFHS 3 Total	Change
<b>Population and Household Profile</b>					
Population (female) age 6 years and above w ho ever attended school (%)	80.6	63	68.8	58.3	10.5
Sex ratio of the total population (females per 1,000 males)	956	1,009	991	1,000	-9
Sex ratio at birth for children born in the last five years (females per 1,000 males)	899	927	919	914	5
<b>Characteristics of Adults (age 15-49)</b>					
Women who are literate (%)	81.4	61.5	68.4	55.1	13.3
Women with 10 or more years of schooling (%)	51.5	27.3	35.7	22.3	13.4
<b>Marriage and Fertility</b>					
Women age 20-24 years married before age 18 years (%)	17.5	31.5	26.8	47.4	-20.6
Total fertility rate (children per woman)	1.8	2.4	2.2	2.7	-0.5
<b>Anaemia among Children and Adults</b>					
Non-pregnant women age 15-49 years who are anaemic (<12.0 g/dl) (%)	51	54.4	53.2	55.2	-2
Pregnant women age 15-49 years who are anaemic (<11.0 g/dl) (%)	45.8	52.2	50.4	57.9	-7.5
All women age 15-49 years who are anaemic (%)	50.8	54.3	53.1	55.3	-2.2
<b>Hypertension among Women (age 15-49 years)</b>					
Slightly above normal (Systolic 140-159 mm of Hg and/or Diastolic 90-99mm of Hg) (%)	7.3	6.5	6.7	n.a	n.a
Moderately high (Systolic 160-179 mm of Hg and/or Diastolic 100-109 mm of Hg) (%)	1.6	1.3	1.4	n.a	n.a
Very high (Systolic ≥180 mm of Hg and/or Diastolic ≥110 mm of Hg) (%)	0.7	0.7	0.7	n.a	n.a
<b>Women's Empowerment and Gender Based Violence (age 15-49 years)</b>					
Currently married women who usually participate in household decisions (%)	85.8	83	84	76.5	7.5
Women who worked in the last 12 months who were paid in cash (%)	23.2	25.4	24.6	28.6	-4
Ever-married women who have ever experienced spousal violence (%)	25.3	34.1	31.1	37.2	-6.1
Ever-married women who have experienced violence during any pregnancy (%)	3.4	4.1	3.9	n.a	n.a
Women owning a house and/or land (alone or jointly with others) (%)	35.2	40.1	38.4	n.a	n.a
Women having a bank or savings account that they themselves use (%)	61	48.5	53	15.1	37.9
Women having a mobile phone that they themselves use (%)	61.8	36.9	45.9	n.a	n.a
Women age 15-24 years who use hygienic methods of protection during their menstrual Period (%)	77.5	48.2	57.6	n.a	n.a

Source NFHS 4 and NFHS 3

### **Malnutrition among Women in India: State Level Analysis**

Table 2 presents the state wise scenario of women malnutrition. The data is presented in two parts because India is currently suffering from dual burden of malnutrition and this burden is rapidly increasing among women. Though there is marginal fall in the rate of under nutrition among women but still the percentage of under nourishment among Indian women is high. Along with this we are witnessing a rapid increase in obesity among women. In order to understand the pattern of under nutrition and obesity in India we now do a state level analysis to figure out the states with maximum and minimum number of malnourished women. We will classify the states as top rung, upper middle rung, lower middle rung and bottom rung based on health and wellbeing of women.

Jharkhand (31.5 percent), Bihar (30.4 percent), Madhya Pradesh (28.4 percent), Gujrat (27.2 percent), Rajasthan (27 percent), Chhattisgarh(26.7 percent), Odisha (26.5 percent), Assam(25.7 percent) and Uttar Pradesh(25.3 percent) have more than one fourth of its women population being under nourished and are classified as the bottom rung states. The states with more than 15 percent to 20 percent of undernourished women forms the lower middle rung, it consists of Maharashtra (23.5 percent), Telangana (22.9 percent), West Bengal(21.3 percent) Karnataka(20.7 percent), Tripura (18.9 percent), Uttarakhand (18.4 percent), Andhra Pradesh(17.6 percent), Himachal Pradesh( 16.2 percent) and Haryana (15.8 percent). If we look at child malnutrition and women malnutrition we find high degree of association between both because the states with high degree of women under nutrition is also the ones with high degree of child malnutrition. This indicates the relationship between women and Child health. The exceptions are Meghalaya (12.1) and Delhi (14.9 percent) where now the proportion of women with obesity is a greater than those suffering from under nutrition. The second observation made here is that greater proportion of children are undernourished as compare to the proportion of women in the same state, for instance in Jharkhand 47.8 percent children are underweight and

31 percent women are undernourished. Similarly in Madhya Pradesh 42.8 percent children are malnourished and 28.4 percent women are undernourished. The upper middle rung consists of states with 10 to 15 percent of undernourished women. These states are Delhi (14.9 percent), Goa(14.7 percent), Tamil Nadu(14.6 percent), Chandigarh(13.3 percent) Andaman and Nicobar(13.1 percent), Nagaland(12.3 percent) Jammu and Kashmir and Meghalaya(12.1 percent) and Punjab(11.7 percent). Apart from them the states with less than one tenth of its population as under nourished are classified as top rung states which are Kerala(9.7 percent) and mostly from the north eastern part of India Manipur(8.8 percent), Arunachal Pradesh (8.5 percent), Mizoram (8.4 percent) and Sikkim(6.4 percent).

Looking into the second side of the problem, obesity is on rise in all the states of India and has increased at a rapid rate between NFHS 3(2005-06) and NFHS4 (2015-16). The states with high level of obesity of about one third or more of women in the state being obese are Chandigarh(41.5 percent) followed by Delhi(33.5 percent), Goa(33.5 percent) Andhra Pradesh (33.4 percent), Kerala(32.4 percent), Andaman ad Nicobar(31.8 percent), Punjab(31.3 percent) and Tamil Nadu(30.9 percent). Other states with almost one fourth of women being obese are Jammu and Kashmir(29.1 percent), Himachal Pradesh(28.6 percent), Telangana(28.6 percent), Sikkim(26.7 percent), Manipur(26 percent), Gujrat(23.7 percent), Maharashtra(23.4 percent), Karnataka(23.3 percent) and Haryana(21 percent). These states together builds up the bottom rung and the lower middle rung. It is lowest in states of Chattisgarh (11.9 percent), Bihar(11.7 percent) and Jharkhand(10.3 percent) which are basically the states with high percentage of under nutrition. This pattern is quite obvious because the dominant factors in these states are those that leads to high degree of under nutrition, for instance these are poor states of India with low GDP and growth rates. Also there are states like Delhi, Tamil Nadu, Goa etc. which has high percentage of under nourished women and Children along with high obesity. This points out towards a need of dual setup program to target two opposite problems coexisting at the same time.



Table 2: Under Nutrition and Obesity among Women Across Indian States in 2015-16

Malnutrition Among women In India			Malnutrition Among women (obesity)		
NFHS 4	BMI<18.5Kg/ m <sup>2</sup>	Aneamic	NFHS 4	BMI >25 Kg/ m <sup>2</sup>	
Jharkhand	31.5	65.2	Chandigarh		41.5
Bihar	30.4	60.3	Delhi		33.5
Madhya Pradesh	28.4	52.5	Goa		33.5
Gujrat	27.2	54.9	Andra Pradesh		33.2
Rajasthan	27	46.8	Kerala		32.4
Chattisgarh	26.7	47	Andaman and nicobar		31.8
Odisha	26.5	51	Punjab		31.3
Assam	25.7	46	Tamil Nadu		30.9
Uttar Pradesh	25.3	52.4	Jammu and Kashmir		29.1
Maharashtra	23.5	48	Himachal pradesh		28.6
Telangana	22.9	56.6	Telangana		28.6
West Bengal	21.3	62.5	Sikkim		26.7
Karnataka	20.7	44.8	Manipur		26
Tripura	18.9	54.5	Gujrat		23.7
Uttrakhand	18.4	45.2	Maharashtra		23.4
Andra Pradesh	17.6	60	Karnataka		23.3
Himachal pradesh	16.2	53.5	Haryana		21
Haryana	15.8	62.7	Mizoram		21
Delhi	14.9	54.3	Uttrakhand		20.4
Goa	14.7	31.3	West Bengal		19.9
Tamil Nadu	14.6	55	Arunachal Pradesh		18.8
Chandigarh	13.3	75.9	Odisha		16.5
Andaman and nicobar	13.1	65.7	Uttar Pradesh		16.5
Nagaland	12.3	27.9	Nagaland		16.2
Jammu and Kashmir	12.1	49.4	Tripura		16
Meghalya	12.1	56.2	Rajasthan		14.1
Punjab	11.7	53.5	Madhya Pradesh		13.6
Kerala	9.7	34.3	Assam		13.2
Manipur	8.8	26.4	Meghalya		12.2
Arunachal Pradesh	8.5	43.2	Chattisgarh		11.9
Mizoram	8.4	24.8	Bihar		11.7
Sikkim	6.4	34.9	Jharkhand		10.3

Source NFHS 4

### Rural urban Scenario of Malnutrition among Women

Table 3 shows the rural urban pattern of malnutrition among women. Under nutrition among women is higher in rural areas as compared to urban areas. The difference in percentage of undernourished women between rural and urban areas has been as high as 16 percent in Gujrat. There exist large variation in proportion of undernourished women in rural and urban areas. The other states in which the difference in the proportion of undernourished women is high are Jharkhand (13.8 percent), Maharashtra (13.2 percent), Telangana (13.1 percent), Odisha (12.9 percent) and Chattisgarh (12 percent).

On the other hand the problem of obesity is primarily concentrated in urban areas. There is an excess of proportion of obese women in urban areas over rural areas for all the states. The urban excess over rural in proportion of obesity among women is largest in the following states: Telangana (21.7 percent), Gujrat (19.2 percent), Odisha (18.7 percent) and Maharashtra (17.8 percent). The urban excess over rural is more than 10 percent for almost all states of India.

Table 3: Rural Urban Scenario of Women Malnutrition: 2015-16

Rural urban differential in women malnutrition					Obesity				
states	All Areas	URBAN	Rural	Rural excess over Urban	state	All Areas	Urban	Rural	Urban Excess over Rural
Jharkhand	31.5	21.6	35.4	13.8	Chandigarh	41.5	n.a	n.a	n.a
Bihar	30.4	22.2	31.8	9.6	Delhi	33.5	33.5	29.2	4.3
Madhya Pradesh	28.4	20.6	31.8	11.2	Goa	33.5	36.3	28.5	7.8
Gujrat	27.2	18.1	34.3	16.2	Andra Pradesh	33.2	45.6	27.6	18
Rajasthan	27	18.6	29.9	11.3	Kerala	32.4	33.5	31.5	2
Chattisgarh	26.7	17.6	29.6	12	Andaman and nicobar	31.8	38.3	26.6	11.7
Odisha	26.5	15.8	28.7	12.9	Punjab	31.3	32.4	30.6	1.8
Assam	25.7	17.9	27	9.1	Tamil Nadu	30.9	36.2	25.4	10.8
Uttar Pradesh	25.3	17.6	28.1	10.5	Jammu and Kashmir	29.1	40.6	24.1	16.5
Maharashtra	23.5	16.8	30	13.2	Himachal pradesh	28.6	38.4	27.6	10.8
Telangana	22.9	15.9	29	13.1	Telangana	28.6	40.2	18.5	21.7
West Bengal	21.3	14.1	24.6	10.5	Sikkim	26.7	34.1	23.1	11
Karnataka	20.7	16.2	24.3	8.1	Manipur	26	31.2	22.4	8.8
Tripura	18.9	16.2	20.1	3.9	Gujrat	23.7	34.5	15.3	19.2
Uttrakhand	18.4	15.5	20	4.5	Maharashtra	23.4	32.4	14.6	17.8
Andra Pradesh	17.6	11.5	20.3	8.8	Karnataka	23.3	31.8	16.6	15.2
Arunachal Pradesh	16.4	8.7	8.5	-0.2	Haryana	21	24.3	18.8	5.5
Himachal pradesh	16.2	11.7	16.7	5	Mizoram	21	26.8	12.5	14.3
Haryana	15.8	12.2	18.2	6	Uttrakhand	20.4	28.4	16	12.4
Delhi	14.9	14.9	14.4	-0.5	West Bengal	19.9	30.6	15	15.6
Goa	14.7	10.3	22.2	11.9	Odisha	16.5	32	13.3	18.7
Tamil Nadu	14.6	10.9	18.5	7.6	Uttar Pradesh	16.5	27.1	12.6	14.5
Chandigarh	13.3	n.a	n.a	n.a	Nagaland	16.2	20.7	13.3	7.4
Andaman and nicobar	13.1	10.1	15.5	5.4	Tripura	16	23.5	12.8	10.7
Nagaland	12.3	12.9	11.8	-1.1	Rajasthan	14.1	23.7	10.7	13
Jammu and Kashmir	12.1	7.7	14.1	6.4	Madhya Pradesh	13.6	23.8	9.1	14.7
Meghalaya	12.1	11.4	12.3	0.9	Assam	13.2	26.1	10.9	15.2
Punjab	11.7	9	13.5	4.5	Meghalaya	12.2	18.4	10.2	8.2
Kerala	9.7	9.1	10.2	1.1	Chattisgarh	11.9	24.4	7.8	16.6
Manipur	8.8	8.5	9	0.5	Bihar	11.7	23.5	9.7	13.8
Mizoram	8.4	7.5	9.6	2.1	Jharkhand	10.3	21.7	5.9	15.8
Sikkim	6.4	7.5	5.8	-1.7	Arunachal Pradesh	8.8	25.8	16.3	9.5

Source NFHS 4

### Performance of States in Reducing Malnutrition Among Women

Table 4 confirms that the relative performances of states in reducing malnutrition among women have been mixed. It shows that the proportion of undernourished women has fallen and overweight/obesity among women has increased in all the states. The proportion of fall in undernourishment among women varies from 18 percent in Tripura to 16.7 percent in Chattisgarh, one of the highest malnourished states of India to 2.5 percent in Meghalaya. The high women malnourished state have shown a greater fall of around 10 to 15 percent where as low women malnourished states have shown a fall of around 2 to 8 percent. Delhi is the only state with a marginal rise of 0.1 percent in proportion of undernourished women. On the other hand obesity which is more than 30 percent in some states in 2015-16 is rising in all the states between 2005-06 and 2015-16. The rise in obesity is as high as 15.1 percent in Himachal Pradesh, followed by Goa (13.3 percent), Manipur (12.7 percent), Jammu and Kashmir (12.4 percent), Sikkim (11.3 percent) and Mizoram (10.4 percent). These are basically the top rung and upper middle rung states with low obesity and low undernourished population. This means that obesity is increasing faster in states where it is not on the higher side. The increase in obesity is lowest in Punjab (1.4 percent), Haryana (3.6 percent) Kerala (4.3 percent), Jharkhand (4.9 percent), Rajasthan (5.2 percent), Chattisgarh (6.3 percent), Meghalaya (6.9 percent), Bihar (7.1 percent) and Delhi (7.1 percent). Except Goa (13.3 percent) all other states with high level of obesity have only shown marginal increase which means that the states with high obesity witnessed slower increase in it but continued to remain high over the period of ten years from 2005-06 to 2015-16. Also the rise in obesity is lowest in the states with high level of under nutrition like Bihar, Jharkhand, and Chattisgarh.

Table 4: Trends in Malnutrition among Women across States

Under nutrition				Overweight/Obesity			
States	NFHS 4	NFHS 3	Change	NFHS 4	NFHS 3	Change	States
Jharkhand	31.5	42.9	11.4	41.5	n.a	n.a	Chandigarh
Bihar	30.4	45	14.6	33.5	26.4	7.1	Delhi
Madhya Pradesh	28.4	41.7	13.3	33.5	20.2	13.3	Goa
Gujrat	27.2	36.3	9.1	33.2	n.a	n.a	Andra Pradesh
Rajasthan	27	36.7	9.7	32.4	28.1	4.3	Kerala
Chattisgarh	26.7	43.4	16.7	31.8	n.a	n.a	Andaman and Nicobar
Odisha	26.5	41.4	14.9	31.3	29.9	1.4	Punjab
Assam	25.7	36.5	10.8	30.9	20.9	10	Tamil Nadu
Uttar Pradesh	25.3	36	10.7	29.1	16.7	12.4	Jammu and Kashmir
Maharashtra	23.5	36.2	12.7	28.6	13.5	15.1	Himachal pradesh
Telangana	22.9	n.a	n.a	28.6	n.a	n.a	Telangana
West Bengal	21.3	39.1	17.8	26.7	15.4	11.3	Sikkim
Karnataka	20.7	35.4	14.7	26	13.3	12.7	Manipur
Tripura	18.9	36.9	18	23.7	16.7	7	Gujrat
Uttrakhand	18.4	30	11.6	23.4	14.5	8.9	Maharashtra
Andra Pradesh	17.6	n.a	n.a	23.3	15.3	8	Karnataka
Arunachal Pradesh	8.5	16.4	7.9	21	17.4	3.6	Haryana
Himachal pradesh	16.2	29.9	13.7	21	10.6	10.4	Mizoram
Haryana	15.8	31.4	15.6	20.4	12.8	7.6	Uttrakhand
Delhi	14.9	14.8	-0.1	19.9	11.4	8.5	West Bengal
Goa	14.7	27.9	13.2	16.5	6.6	9.9	Odisha
Tamil Nadu	14.6	28.4	13.8	16.5	9.2	7.3	Uttar Pradesh
Chandigarh	13.3	n.a	n.a	16.2	6.4	9.8	Nagaland
Andaman and Nicobar	13.1	n.a	n.a	16	7.1	8.9	Tripura
Nagaland	12.3	17.4	5.1	14.1	8.9	5.2	Rajasthan
Jammu and Kashmir	12.1	24.6	12.5	13.6	7.6	6	Madhya Pradesh
Meghalaya	12.1	14.6	2.5	13.2	7.8	5.4	Assam
Punjab	11.7	18.9	7.2	12.2	5.3	6.9	Meghalaya
Kerala	9.7	18	8.3	11.9	5.6	6.3	Chattisgarh
Manipur	8.8	14.8	6	11.7	4.6	7.1	Bihar
Mizoram	8.4	14.4	6	10.3	5.4	4.9	Jharkhand
Sikkim	6.4	11.2	4.8	18.8	8.8	10	Arunachal Pradesh

## Conclusion

To conclude the data reveals improvement in selected socio economic factors that are linked to women health and nutritional wellbeing over the period 2005-06 to 2015-16. The data also suggests low rate of improvement in rural areas as compare to urban areas with respect to these selected indicators which again can be accepted partially as a reason for high malnutrition rate among women in rural areas as compare to urban areas. The current scenario though have witnessed improvement over the past but still suggest lack of reach of basic health services and a scope for further improvement with respect to some key indicators like literacy rate and other factors determining women empowerment which directly impacts women nutritional and wellbeing status.

The current scenario of health and nutrition doesn't give us a chance to appreciate lower under nutrition in some states because these same states are the one which have the highest proportion of obesity. Clearly we can make the observation that today obesity among women is extremely high especially in the high income states like

Delhi, Chandigarh, and Punjab etc. It needs attention because this is the new emerging health problem accompanying prosperity across states and is definitely a bigger threat in near future if not controlled as obesity leads to many serious health problems and shall lead to a negative impact on working capacity and hence growth. This demands a deeper analysis of the problem.

We found that obesity is highly concentrated in urban areas and the policies and targeting of the group should be framed accordingly to the data revelation for solving the dual problem of high under nutrition which shows an excess in rural areas and the problem of obesity which shows an excess in urban areas. The data also reveals a continuous rise in obesity and fall in proportion of under nutrition among women in all states. Today more than one third proportion of obese women coexists with more than one fifth proportion of under nourished women in most states of India. This scenario cannot be treated as satisfactory and needs to be addressed with a dual kind of policy framework targeting under nutrition on one hand and overweight and obesity on the other hand

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# A Panorama of the Bitcoin Volatility in the Post Demonetization Era

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## **Abstract**

*With the advent of various types of crypto currencies and the growing interest among the investors across the world, Bitcoin still tops the list for being the most preferred choice among all. The era of digitalization and less cash economy with a view to provide both national and global integration and to promote better governance structures, it becomes imperative to have regulation for the new types of financial instruments. This paper gives a Bird's eye view on the Bitcoin market in India and examines the volatility of the same both pre and post demonetization of the Indian rupee. The findings of the EGARCH and TARARCH Models along with the BDS test results suggest the presence of rich volatility and hidden underlying structure in the Bitcoin market.*

**Key words:** Bitcoin, GARCH, Volatility.

## **Introduction**

Digital or virtual currency is an electronically issued currency, the transferability of which into fiat currency is not guaranteed by the state (European Banking Authority, 2014). The crypto currencies are decentralized digital currencies.

With the approval of the Commodity Futures Trading Commission (CFTC) in 2015 of the temporary listing of an over-the-counter swap product based on the price of aBitcoin gives the proof of Bitcoin's acceptance as a financial product in the US.

Some studies have been carried out on the legal and regulatory aspects of Bitcoin. Negurita (2014) discussed on legal aspects and financial performance of Bitcoin. Demchenko (2017) concentrates on the legal definition of Bitcoin; be it a virtual currency or a financial instrument or a property and how based on the legal definition of Bitcoin in the respective counties, the subsequent regulations be applied. Brandvold et al. (2015) focus on price discovery in the Bitcoin market. Bitcoin is seen as a speculative investment by Yermack (2013).

There have been mixed response among researchers about the value of Bitcoin; from being fundamentally zero (Cheah and Fry, 2015); to something in between gold and American Dollar (Dyhrberg, 2015) and to being digital gold (Popper, 2015).

Few studies also focus on the volatility aspect in the Bitcoin market. Bouri et al. (2016) assess the existence of volatility in the Bitcoin market. Klein et al. (2018) compares the volatility between gold and Bitcoin.

However, the volatility in the Indian Bitcoin market remains unexplored, especially the effect of the recent demonetization of the Indian rupee (i.e. on 8<sup>th</sup> November 2016) on the volatility. In this paper we try to look into the Bitcoin market and examine the volatility of the same pre and post demonetization of the Indian rupee. This is essential for the policy makers and regulators who are in the process of formulating guidelines for the Bitcoin market.

The rest of the paper is structured as follows. Section 2 gives a genesis of the cryptocurrencies market and Bitcoin. Section 3 discusses the data and econometric model. Section 4 presents the empirical results. Section 5 provides the findings and conclusion.



## Review of Literature on Cryptocurrency Market and Bitcoin

The first attempts to use cryptography to build digital currencies date back in the late 1980s. The Internet was the environment that facilitated the creation of significant online communities of people driven by common interests that needed a safe payment system for their online transactions. To this end, Wei Dai (1998) proposed for the first time a cryptocurrency under the name of B-money. Wei Dai based his initiative on the fact that in a community the members exchange ideas and even goods and services. An efficient cooperation among them requires a medium of exchange (money) and a way to enforce contracts. To address these issues Wei Dai considered two protocols. One of them was similar to the Bitcoin protocol, based on an undetectable network of individuals identified by a digital pseudonym.

In 2008, Satoshi Nakamoto was claiming there was a need for a purely peer-to-peer version of electronic cash that would bypass the financial institutions. He mentioned the financial institutions as third parties in commercial transactions were necessary due to the trust issues between buyers and sellers and the cost of this “trust” was high because they were not irreversible and involved mediation costs that made the services even more expensive. Nakamoto proposed an electronic payment system based on cryptographic proof (blockchain) instead of trust (Nakamoto, 2008). Just one year later, the Bitcoin network became functional, now is the most traded cryptocurrency in the world (Table 1).

Table 1 gives the market capitalization for the top five cryptocurrencies as on 1<sup>st</sup> June 2018. From the table it is clear that Bitcoin dominates the cryptocurrency market.

**Table 1. Top 5 Cryptocurrencies Market Capitalizations on the 1<sup>st</sup> of June 2018**

Rank	Name	Market cap (\$)	Price (\$)	Volume (24h) (\$)	Circulation supply
1	Bitcoin	\$126,934,399,900	\$7,436.90	\$5,087,530,000	17,068,187 BTC
2	Ethereum	\$57,412,422,571	\$575.26	\$2,038,650,000	99,802,563 ETH
3	Ripple	\$24,006,128,565	\$0.612558	\$274,328,000	39,189,968,239 XRP *
4	Bitcoin Cash	\$16,874,030,182	\$983.35	\$577,481,000	17,159,688 BCH
5	EOS	\$10,797,517,040	\$12.08	\$1,112,850,000	894,056,226 EOS *

Source: Coinmarketcap.com, 2018

The cryptocurrencies are to the tune of 1640 with a market capitalization of \$328,656,284,409 with penetration across 11,161 markets and with Bitcoin dominance of 38.6 % (Coinmarketcap.com, June 1, 2018). With internet connecting the markets across the globe the use of digital currency has substantially increased.

The primary driver for the emergence of cryptocurrencies according to Vigna and Casey (2016) is the current bias towards decentralised models “that bypass middlemen gatekeepers”. People embrace these models realising the possibility to avoid intermediaries when searching for goods or services. On the other hand, young people see Bitcoin as a means to invest or save money. For them, it makes more sense to acquire these new currencies than to invest in gold, or bonds or any other liquid assets.

So far as India is concerned Bitcoin have been in existence as a financial instrument. However, after the recent demonetization of 2016 there is an upsurge of participants in the Bitcoin market. One of the reasons for the rise in the Investors’ interest could be the demonstration effect which is attached with the Bitcoin, which has not just grown significantly in the advanced nations like the US

and Australia but also in the most tumultuous times in nations like Cyprus (Liu, 2013).

The future of Bitcoin in India is unpredictable now as the RBI has not yet given the Green signal for its full acceptance. However, in the economic downturn Investors have shown interest in the cryptocurrencies and especially Bitcoin across the globe.

### Research Methodology

#### Data and Econometric Model

We use daily returns on Bitcoin from March 21, 2013 to May 10, 2018, calculated as the log differences in prices multiplied by 100. The data is compiled from coinmarketcap.com. The database for the entire period (1,877 daily observations) covers the demonetization period from November 08, 2016 to December 30, 2016 and thus allows us to examine how the volatility of Bitcoin was affected as a result.

Accordingly, the pre-demonetization period (1321 daily observations) and the post demonetization period (556 daily observations) are defined.

Figures 1 and 2 give the daily closing prices and daily return respectively of Bitcoin prices in Indian Rupee denominations. Figure 2 clearly shows that large changes in prices tend to cluster together, resulting in persistence of volatility.

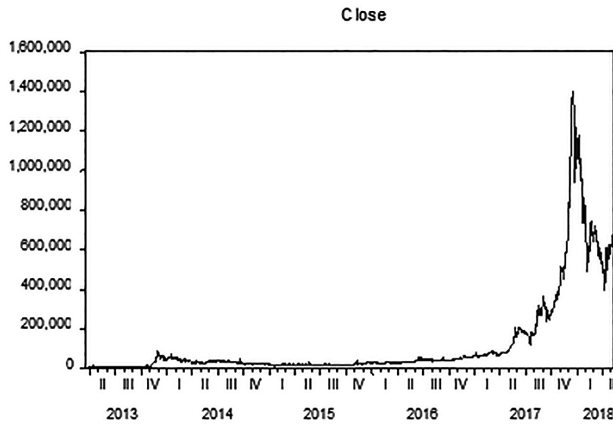


Figure 1.Bitcoin Daily Closing Prices

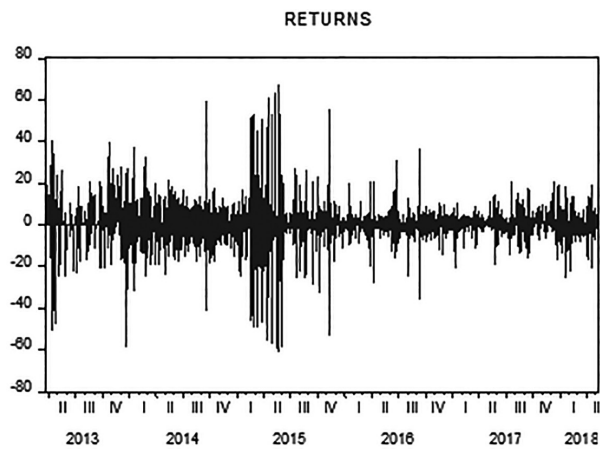


Figure 2.Bitcoin Daily Returns

The first step was to check for stationarity using Unit root test. Here Break point Unit root test was applied and the break date was found to be 9<sup>th</sup> April 2013.

**The Model**

Based on the minimum SIC and AIC model selection was done and it was found to be a MA(1) Process.

The asymmetric-GARCH model of Glosten et al.(1993) is used to capture volatility. The conditional mean of Bitcoin returns is calculated using Eq. (1) and the conditional

variance of Bit coin returns is calculated using Eq. (2) as follows:

$$R_t = \mu + \varepsilon_t \tag{1}$$

$$h_t = \omega + \alpha(\varepsilon_{t-1}^2) + \beta(h_{t-1}) + \gamma(\varepsilon_{t-1}^2)I(\varepsilon_{t-1} < 1) \tag{2}$$

In Eq. (2),  $\omega$  is the constant volatility,  $\alpha$  represents the ARCH term which measures the impact of past innovations on current variance,  $\beta$  represents the GARCH term which measures the impact of past variance on current variance,  $\gamma$  is the error term and captures any potential symmetric effect of lagged shocks on the volatility of Bitcoin.

**Empirical Results and Discussion**

Table 2. Summary statistics of Bitcoin daily returns

	Mean	Standard Deviation	Skewness	Kurtosis
Entire period (21/3/2013 to 10/5/2018)	0.273641	10.43330	0.046922	13.47257
Pre-demonetisation period (21/3/2013 to 31/10/2016)	0.190808	11.80526	0.077793	11.53290
Post-demonetisation period (01/11/2016 to 10/5/2018)	0.470444	6.035670	-0.288407	5.361546
Period of demonetization (8/11/2016 to 30/12/2016)	0.558674	4.386874	-0.640295	4.872233

As reported in Table 2, Bitcoin returns during the all the periods are positive, but has increased in the post-demonetization period. The volatility of Bitcoin is highest during the pre-demonetization period and lowest during the post-demonetization period. The return distribution is negatively skewed in the post-demonetization period. The return distribution for all periods is more peaked than a normal distribution. Results from Engle’s ARCH test justify the appropriateness of using a GARCH framework to model the conditional volatility.

Table 3 Coefficient estimates of the TARCH and EGARCH MODEL

	Constant	ARCH	GARCH	Asymmetry	EGARCH
Entire period (21/3/2013 to 10/5/2018)	1.820787* (0.0000)	0.156142* (0.0000)	0.854905* (0.0000)	-0.030262** (0.0655)	0.024847* (0.0127)
Pre-demonetisation period (21/3/2013 to 31/10/2016)	2.749102* (0.0000)	0.139613* (0.0000)	0.867557* (0.0000)	-0.048269* (0.0047)	0.036427* (0.0005)
Post-demonetisation period (01/11/2016 to 10/5/2018)	1.839455* (0.0001)	0.206594* (0.0000)	0.760511* (0.0000)	0.007747 (0.8542)	-0.012004 (0.6416)

\*at 1% and 5% level of significance and \*\* at 10%level of significance

Coefficient estimates are reported in Table 3. Based on the Schwarz information criterion and log likelihood value the asymmetric-GARCH (1,1) or TARCH or GJR-GARCH model is found to be the best fit. Furthermore, there is no evidence of conditional heteroscedasticity in the squared residuals.

Across all Panel estimates, the ARCH and GARCH terms are highly significant, with the GARCH term dominating the ARCH term, indicating that the volatility of Bitcoin is highly persistent. Over the entire period and Pre-demonetisation period the coefficient for the asymmetric term ( $\gamma$ ) is negative and is positive in the post-demonetisation period, but is significant in the pre-demonetisation period only i.e. in the pre-demonetisation period, it is negatively significant.

Before the demonetization of 2016, Bitcoin was characterized by an inverse asymmetric volatility phenomenon, meaning that shocks to return were positively correlated with shocks to volatility. **If  $\gamma$  is significantly negative, then a positive shock generates more volatility than a negative shock of the same magnitude.**

In the post demonetisation period, however, the inverse asymmetric effect disappeared, suggesting that the demonetisation has ended the safe-haven capabilities of Bitcoin.

### Results of the BDS Test

We ran the BDS test to test for dependence in the log returns and results were significant ( $p=0.0000$ ) and are suggestive of some hidden underlying structure. Such hidden nonlinearity, and hidden nonstationarity or other type of structure is often interpreted to mean that the system may be approaching a critical transition. This means speculative bubbles might be hidden.

### In this subsection, we examine the robustness of our main findings.

First, we assess whether our findings are robust to the choice of the asymmetric GARCH model. We therefore compare the estimated asymmetric-GARCH model with its symmetric-GARCH counterpart to indicate the preferred GARCH model according to the log-likelihood function.

Intuitively, the asymmetric-GARCH model has larger values for the log-likelihood function in all the sample periods under study, suggesting that asymmetric-GARCH model outperforms the simple symmetric-GARCH model and explains better the conditional volatility of Bitcoin returns.

Second, we estimate the Exponential-GARCH, an alternative to the asymmetric-GARCH model of Glosten et al. (1993), for the entire period and two sub-periods. Results indicate that the asymmetric term of the Exponential-GARCH model is positive and significant in the pre-demonetisation period. This finding, which is consistent with the inverse asymmetric effect as positive return shocks in the Bitcoin market generate more volatility than negative shocks of the same magnitude, shows that the volatility asymmetry is not affected by the choice of the asymmetric-GARCH model.

### Findings and Conclusion

Using a different methodological approach to prior studies, this paper focuses on the safe-haven property of Bitcoin and its relationship to the demonetization of December 2016. Based on an asymmetric-GARCH framework, the main results indicate that in the pre-demonetization period, Bitcoin has a safe-haven property somewhat similar to gold. After the demonetization however, this safe-haven property disappears. The results also indicate that the volatility asymmetry is not



affected by the choice of the asymmetric-GARCH model. Post demonetisation and the stringent norms against accepting Bitcoin has led to the disappearance of the inverse asymmetric effect and safe haven capabilities of Bitcoin.

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# Spillover of COVID-19: Impact on the Tourism Industry

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## Abstract

*The COVID-19 pandemic is posing a biggest threat to the mankind worldwide ever. In the absence of any definite antidote and the modest health-care provisions to medicate the virus, NPI (non-pharmaceutical interventions) are the key techniques to control the spread of global health emergency. In an attempt to counteract pandemics, several nations have issued advisories on social distancing, working from home (WFH) and virtual meetings that has severely affected travel and tourism industry around the world. Unparalleled and revolutionary travel bans and the enforcement of strict stay-at-home orders all across the world have triggered the acutest economic downturn past World War II with apprehensions of recession looming in many countries. With the movement control order issued by many countries and nation-wide restrictions on large events and mass gatherings like conferences, festivals, concerts, sporting events, weddings, tourism to a great extent came to a standstill by the end of March 2020. Initial estimates on impacts on aviation sector, cruises, and hotel industry have been terribly shocking. While extremely unpredictable, initial forecasts from UNWTO (World Tourism Organization) propose tourist arrivals globally might fall by 60% - 80% in the year 2020 when compared with the figures of 2019. The paper examines the impact of COVID-19 outbreak on global tourism industry due to travel advisories issued by several nations and explores how the pandemic may transform the dynamics of tourism industry.*

**Keywords:** Covid-19, Coronavirus, Outbreak, Pandemic, Tourism, Hospitality, Global

## Introduction

A mysterious pneumonia expounded by fever, weariness, lethargy, fatigue and intermittent gastrointestinal disorder was reported in Wuhan (capital city of Hubei Province in China) in the end of December 2019 which spread in 41 local residents who were hospitalized in Hubei (Huang et al., 2020). In the first week of January 2020, these patients were found infected by a novel coronavirus (COVID-19). In spite of warnings issued by the intelligence services regarding its disastrous nature, the virus was initially overlooked by political stalwarts of different countries (Washington Post, 2020). As a preventive measure against the COVID-19 pandemic, the government of China ordered a lockdown in Wuhan and the number of infected people settled down at approximately eighty thousand on 15<sup>th</sup> February (ECDC 2020). Until then, owing to the global air transport, the pandemic had already been established in 150 nations and the toll of documented cases worldwide increased

twofold rapidly, coupled with a series of superspreading events (SSE), like the Austrian ski resort town of Ischgl wherein an event may transmit infection to a larger number of individuals than is usual by one event (Anderson et al., 2020; Johns Hopkins, 2020). Therefrom, the pandemic gained momentum and contamination rate speeded up through community transmission, and by June 01, 2020 tally of infected people reached 6.3 million (with more than 0.375 million deaths) in 213 nations (Worldometer 2020).

The actual figures are still uncertain owing to minimal testing capacity in various nations. In the absence of any vaccine to control the spread of pandemic and restricted health-care facilities, many countries have resorted for different kinds of non-pharmaceutical interventions (NPI) and community mitigation strategies, like social distancing/physical distancing, the closures of academic institutions and workplaces, isolation, quarantine (home/institutional), restricting the movement of people and the

cancellation/postponement of mass gatherings (sporting events, conferences, religious gathering) stay-at-home orders, nation lock-down, shutting down of swimming pool, gymnasium, movie theatres, malls, auditoriums, restrictions on assembly of individuals in excess of specific count and prohibiting the sale of non-essential items through e-commerce platforms, etc.

Travel restrictions at different levels – local, regional, national as well as international owing to travel bans and closing borders adversely affected tourism system of every country ruining the fortunes of events sector, aviation sector, cruises, public transportation system, hotel and accommodation, dining outlets, retail stores and recreation activities leading to a sharp decline in international and domestic tourism. Countries scuffled to get back their nationals that comprised of several hundred thousand of citizens stuck in all corners of the globe. For an instance, the British Foreign Secretary on March 23, 2020 appealed its citizens to travel overseas only if unavoidable citing that international travel is challenging due to sealing of national frontiers, putting of aircrafts frequently, closure of airports and introduction of new regulations and provisions on daily basis (FCO 2020).

Cruise liners pretty soon became the nightmare scenario for vacationers as at least 25 cruise lines along with the Diamond Princess had confirmed cases of COVID-19 by March 26, 2020 (Mallapaty, 2020) and by the month-end 10 ships stood stranded in water with no place for passengers to disembark. Cordesmeyer & Papathanassis (2011) revealed that lakhs of holiday makers were detained quarantine in private rooms confronted with the issue of coming back to their origin as their ships scrambling for a place to dock.

Within countries, each segment of tourism industry got affected by corona virus outbreak. Reports on retrenchments and insolvencies broadcasted, with British Airline FlyBe declaring it bankrupt on March 5, 2020 (Business Insider, 2020). Key carriers like Scandinavian Airlines, Singapore Airlines, Virgin as well as German tour operator Touristik Union International (portfolio consisting of 1,650 tour operators and prominent web-based portals, 5 aircrafts comprising 155 carriers, more than 415 hotels, 20 cruise ships) have already been granted assistance of more than US\$20 billion, while US\$55 billion have been provided to US passenger aircrafts (Reuters, 2020).

The situation is unparalleled and unprecedented and within a couple of months, the tourism industry framework changed from over tourism (Seraphin et al., 2018; Dodds & Butler, 2019) to non-tourism. Nevertheless, the silver lining is that tourism industry will bounce back as evident from the past downturns

and crisis (CNN, 2020). Yet, considering the disastrous nature of COVID-19 it is very much certain that the crisis will be revolutionary and a game-changer for the global tourism industry.

### Objectives of the Study

The study is proposed with the following objectives:

- To examine the observed impact of COVID-19 outbreak on global tourism industry due to travel advisories issued by several nations through to the end of May 2020.
- To assess the repercussions of COVID-19 on the future of tourism industry.

### Research Methodology

The present study was carried out through comprehensive review of secondary data, collected particularly from various journals, magazines, publications and periodicals of ministry of tourism, International Civil Aviation Organization (ICAO), International Air Transport Association (IATA), World Tourism Organization (UNWTO), World Travel & Tourism Council (WTTC), European Centre for Disease Prevention and Control (ECDC), etc.

### Pandemics and Tourism

Global tourism is quite susceptible and has witnessed a considerable number of exigencies in the past like 9/11 terrorist attacks in United States, 26/11 Terror Attack in Mumbai, Severe Acute Respiratory Syndrome (SARS-CoV) pandemic in 2002, The Global Financial Crisis widely referred to as The Great Recession in 2009, and The Middle East Respiratory Syndrome (MERS-CoV) pandemic in 2012. However, not any has had a detrimental consequence on the global tourism industry, and most of them are not even salient, with only SARS-CoV (-0.4%) and The Great Recession (-4.0%) resulting in sharp downfall in terms of international tourist footfalls (World Bank 2020a). That, in turn reflects that travel industry remained strong and buoyant to setbacks. Despite that, considering the current situation, the revival from the present pandemic situation will be unprecedented.

Due to global transitions taking place, the incidences of pandemics and diseases has been rising. The 20<sup>th</sup> century witnessed three pandemic outbreaks – The Spanish flu also called the 1918 flu pandemic caused by H1N1 virus, the 1957–1958 influenza pandemic, also called Asian flu resulting from H2N2 virus, the 1968-1969 Hong Kong flu resulting from H3N2 virus. The present century has so far witnessed pandemics like SARS outbreak (2002), Swine flu (2009), MERS outbreak (2012), and

EVD (Ebola virus disease) that reached record levels in 2013-16. Greger, (2007); Coker et al., (2011) and Wu et al., (2017) revealed that global change is the main reason behind these pandemic outbreaks. The latest publication highlighted that even a Hong Kong Flu outbreak might result in lowering of world gross domestic product by nearly US\$3.1 trillion while a Spanish flu pandemic lowers world gross domestic product by more than US\$10 trillion in present times (McKibbin and Fernando 2020).

There is a strong correlation between travel and pandemic outbreak (Burkle, 2006). The key reason behind growing number of threat due to pandemic outbreaks in the 21<sup>st</sup> century is – increasing mobility of population, modernization of people, processed foods in supply chain, mass consumption of ready to eat and junk foods, the aggressive development of global infrastructural framework leading to the dissemination of virus causing disease (Pongsiri et al., 2009; Labonte et al., 2011). Epidemic incidences like SARS, EVD, the MARV (Marburg virus), Orthohantaviruses, (ZIKV) Zika virus and Bird flu are all aftermaths of human interferences on ecological system and biological diversity (World Bank, 2012; Petersen et al., 2016; Schmidt, 2016).

### Covid-19 and Tourism

We have witnessed several outbreaks of pandemics in the past, but not a single incident had alike repercussions on the economy as the COVID-19 outbreak. With the introduction of lockdown in many nations, advisories on travel restrictions, and the closure of national borders and airports (domestic and international), global tourism has slowed down significantly. Travel and **tourism industry has been the hardest hit segment of the economy** with aircrafts putting off their flights, hotels and accommodation shut and bans on mass gatherings affecting the events industry in almost all corners of the globe. The situation is transcendent for the travel industry.

### Observed Impacts

According to a report published by UNWTO (2020a) on March, 2020, it was anticipated that the COVID-19 would result international arrivals to fall by 1-3% (as compared to figures of 2019) contrary to the projected growth of 3-4%. However, in a statement released on March 26, 2020, this figure deteriorated to 20-30% (UNWTO 2020b). Another press release by UNWTO (2020c) revised this estimation to a fall of 60-80% in tourist footfalls globally.

An updated report from World Tourism Organization (UNWTO 2020c) estimated a loss of 22% in international tourist arrivals during January – March 2020 which corresponds into a shortage of 70 million tourists globally

leading into US\$82 billion in lost exports. These figures reveal that how hard the travel sector has been struck by coronavirus pandemic. The situation threatens to put the advancements made in Sustainable Development Goals (SDG) at the back-stage. This would also place millions of jobs at stake as tourism is a labor-intensive industry. A recent report by McKinsey and Company, (2020c) reveals that 12.6 million jobs are at stake in the hotel industry in USA (accommodation as well as food sector).

These statistics illustrates the seriousness of the issue as it is very difficult to anticipate the losses to the global tourism industry at this time. The situation looks very grim.

### Projected Impacts

UNWTO (2020d) has envisioned three probable situations for the year 2020 subject to the way corona crisis resolves in future depending on the unlocking and unsealing of international borders:

- Situation 1 (-60%) depending on the relaxation in the travel bans across the borders and the commencement of tourism activity in the month of July
- Situation 2 (-70%) depending on the relaxation in the travel bans across the borders and the commencement of tourism activity in the month of September
- Situation 3 (-80%) depending on the relaxation in the travel bans across the borders and the commencement of tourism activity in the month of December.

Irrespective of the above outlined situations, the shock due to the shortage of demand in global tourism may lead to:

- Decline of 0.850 billion to 1.2 billion tourist arrivals globally
- Shortage of US\$ 0.910 trillion to US\$1.2 trillion in export earnings from travel sector
- 110 to 125 million individuals' employment at stake

Various professional organizations and trade associations have already promulgated evaluation of the repercussions of COVID-19 situation on global travel phenomenon for the present year. However, these forecasts are mere projections as principally it is not clear as to how the present crisis will develop in future leading to tremendous loss of employments in the year 2020. While no institution or tourism body has a crystal sphere to predict what will be the future of the tourism industry in times to come, the projected impact assessment is imperative to realize COVID-19 is not a simple blow to the tourism industry. It is unmatched and unparalleled since the tremendous growth of international tourism initiated in the 1950 its impact will be felt in different extents all across the globe at overlapping times.



## Implications for the Future of Tourism

As on June 01, 2020, the number of coronavirus cases worldwide reached 6.3 million and deaths has surpassed 0.375 million (Worldometer 2020) and unemployment rates have witnessed a sharp increase in many regions, exemplifying the profound implications the COVID-19 outbreak has hitherto for the world economy. In the light of the future epidemic outbreak, there is need to review and re-examine supply chains also called global value chain (GVC), and the distinct responsibility of travel as carrier and sufferer in the event of pandemic outbreak.

The crisis generated by COVID-19 pandemic should be considered as a golden opportunity to meticulously assess and evaluate tourism industry's growth curve, and to examine the rationale of more tourist footfalls inferring substantial gains. This could start with an assessment of the favorable results of the COVID-19 outbreak. To begin with, Simple Flying (2020) has highlighted that airlines have started phasing out gradually the old and ineffective crafts owing to sharp decline in demand.

Video-conferencing, an overlooked option to scale down the transport demand for several years (Banister & Stead, 2004) has been broadly acknowledged by professionals, employees, delegates, academicians, scholars, businessmen avoiding non-essential travel. Cohen et al. (2018) asserted that corporate clients will prefer to travel fairly in the times to come. It is important to note that even high profile meetings like G20 Leaders' Summit was organized for the first time virtually on March 26, 2020 to analyze the threats raised by the COVID-19 outbreak (European Council, 2020).

## Conclusions

The preliminary evaluation of the impact of current pandemic situation has offered an insight into the prevailing crisis, and investigated its impact against previous crisis. Considering the enormity of the COVID-19 outbreak, it is imperative not to return to business like always post-crisis, as against an opportunity to re-examine and review a transformation of the entire tourism infrastructure more oriented to the Sustainable Development Goals (SDG).

Asia and the Pacific, the most affected regions, witnessed a 35% decline in international tourist arrivals in Q1 2020, while Europe saw a 20% decrease, America witnessed 16% decline, Africa (-13%) and the Middle East (-12%) during the same period (UNWTO 2020d). As per a survey conducted by UNWTO (2020c) domestic demand is anticipated to reinstate quicker than international demand. Industry experts foresee cash flows and signs of recovery in the tourism domain by the last quarter of 2020 (Jan-March 2021). On the basis of past evidences,

leisure segment (particularly travel for VFR) is expected to recover faster than business segment. UNWTO projections (2020c) foresee the revival of tourism in Africa and the Middle East will be faster than recovery in America whereas they have a mixed opinion regarding the recovery in Europe and Asia

Countries across the globe are enforcing an array of comprehensive strategies to minimize the repercussions of the COVID-19 crisis and to reinvigorate the tourism industry. However, the main uncertainty ahead is unknown duration of travel restrictions and lockdown measures in response to the pandemic situation. COVID-19 offers salient inferences to the travel sector, government, decision makers and tourism bodies about the effects of developments taking place globally. Looking forward, the quarantine question is "How long the pandemic will last?" and "How to restart Tourism?"

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# Situating Health & Economy as Complementary: Case Study of Need for Re-Adjustments in Laws Amidst Pandemic

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## **Abstract**

*here are several policies belonging to different sectors which were fully active until before the outbreak of the Coronavirus pandemic situation. These policies got redundant because of the pandemic situation, and new changes were brought to meet up the challenges of the situation. Few of the old policies of the government which got redundant in different sectors are listed in the paper. The paper is divided into three parts- framework of laws, changes & ways for future ahead- and it argues that to deal with changing context due co-ordination of reforms in laws is needed. Health, economy, livelihoods and the framework of laws need to be seen in complementary ways.*

## **Introduction**

'Is it the end of the world?' A friend exclaimed when the global corona virus positive cases touched a million mark. In no time it had touched 2 million mark and our globetrotter friend was convinced that it was indeed the end. By the time global lockdown was announced and everyone started getting used to quarantined life mastering their cleaning, cooking and home workout skills while streaming some hobby or the other live on social media, we didn't even realise the number of positive cases had crossed three million mark. As we got on with life, there is an eerie realisation that the world won't end anytime soon but the world as we knew it has ended for sure. People had already started classifying their experiences as BC (Before Covid19), DC (During Covid19) and were gearing up for AC (After Covid19) with no clarity but mere 'educated guesses' on how the world will be once we are, that is if we ever are, totally corona virus free.

There have been ample posts on various platforms that many have realized during lockdown that their lives aren't expensive but lifestyles were. But it was also well and truly evident that these 'lifestyles' supported economies around the world. Tourism, fashion, food delivery, neighborhood café, alcohol industry, which

were scoffed at as 'non-essential' services in the first few weeks of lockdown were soon realized as pillars of driving country's economic growth and generating employment. There were news stories how our cities were registering lowest pollution levels, rivers were showing signs of recovery that billions spent over years could not achieve and animals were found wandering in spaces that were forever jammed with vehicles. But all this was leading to joblessness, pay cuts and heart wrenching visuals of migrant workers marching thousands of miles to their hometowns. This phase times to come after it, has thrown an important question for every concerned nation in particular and the world in general, that what matters most – lives or livelihood.

A virus that started in one corner of the world, spread so fast that in no time it shut the entire world. Social distancing emerged as not just a way to stay clear of your peers and neighbors but also an act between countries where they shut their borders and stopped airlines to restrict movement of people or rather allow entry of people in their territory. Yet this must not be a signal of end of globalization, as isolationism is not the answer to deal with the common challenge. At individual and collective level, one must avoid closing down on interactions, as it would do more harm to the ongoing pauperization of our jobs, economy



### **Old government policies (pre-COVID) getting redundant during the pandemic:-**

**Education Policy:** Earlier the schools had a regular session where teachers and students practices are going to school and attending their classes. Similar activities were also done by all teaching and non-teaching staffs. The classes and other physical activities were conducted in the school premises only. The ISC and the ICSE schools had also introduced the mandatory classes of Yoga in the school premises and were a direct mandate by the Council for the Indian School Certificate Examinations (CISCE) (India Today, 2020).

**Banking policy:** The banking sector always had a strong policy. The official policy of lending loans was very rigid, and though the loan officers had some flexibility which is in their hand, still they ignored to use those flexibilities (Economics, 2020). Also, there were strict rules on loans and its interest.

**Health and Environment policy:** Regarding the Waste Management System, which is related to public health, there were no proper new policies framed before the COVID 19. This poor health management system created risks of infection and toxic effects which were harmful to the people. Whatever policies were there, they were decades old and were hardly effective. The waste management systems were also very poor, and the policies were lying unreviewed for years (EPW, 2020).

**Finance and Taxation policy:** The Finance and Taxation sector also had their traditional system of different kinds of taxes and customs duty on different products which are categorized separately. The taxes also included income taxes earned by individuals (Investindia, 2020). These taxes and customs duty were taken so that the government could collect revenue on their sale. However, there have been some changes in these old policies, and after the COVID 19 pandemic, all these rules and policies got redundant and are no longer in use.

**Labour policy:** It has been seen that the old labour laws were intrusive and overbearing, which were creating problems and hindrance towards the development of the entire manufacturing sectors as a whole (Nanda, 2020). The old and unstructured labour law was also contributing to the country's economic growth and also resulted in more unemployment.

### **How and why are they getting redundant?**

The COVID 19 has drastically affected the entire nation, and there has been a great economic loss because of this to the country. This pandemic effect impacted all sectors of the country like the education, the banking, the finance and the labour industry with the existing policy and created an almost standstill position to all businesses and also to the education system in the country.

The rules and policies are already set up and were also already in place. The problem is that none of the government had put much effort and showed any interest in any of these policies or were very reluctant to look into them and give the effort to revise old policies. The main reason that these policies are now getting redundant is that in many of the sectors they are being forced because they need to maintain their plan of business continuity and because of the strict warnings for precautions from the World Health Organisations and the strict restrictions from the government of Indian, the departments were forced to look back at their respective laws and policies. The departments were compelled to do so because they had to keep their work to be continued.

The pandemic situation led the Education system to look back at their old policy and change it by implementing the digital way of teaching so that social distancing can be maintained and at the same time the classes can be continued, the banking system had to change their policy and make the new policy of giving liberty to the business houses by giving liberty and facilitating loan process. The department of Health and the Environment sector had become more cautious and discouraged old policies in order to stop the contamination of the virus by controlling the process of waste management and its way of transportation for dumping them. The finance department and its system also discouraged their old policies and gave liberty to the people about different kinds of exemptions in terms of customs duty and taxes related to personal income. There had also been a major change in policy related to the labour industry that took place. The big and multinational companies and also the manufacturing sectors were told to discourage the old policies. The old labour law and policies for the manufacturing industries were also looked back and implement of new policies were framed and implemented where the working hours for the labours were strictly addressed, and proper overtime was also clearly mentioned. These are the factors that led to the review of the old policies and compelled the government to discourage them.

COVID-19 brings into focus that now with differences in labor costs shall become less relevant. As organizations embrace an unstructured path with digital transformations, focusing on supply chain locally, tapping on benefits of avoidance of overhead costs of infrastructure maintenance, and pumping it into the cyclic business process must be deliberated. To work on due safety against future global threats requires looking putting digital realms to work at other related segments of economic tasks- management of hazardous waste, creating green jobs, amongst others. With fall in global demand, instability of fossil fuels, looming structural

collapse problems for oil industry, governments must prepare a scheme for investment in renewable energy and using technology to hunt for new avenues for rebooting the economy.

Talks on reform of education and the need to connect it to skills become all the more essential now, as education models that are built on engaging and solution oriented practices can offer multidimensional advantages. Further, due investments by Governments for such undertakings would not only add to new paradigm of learning, but it will be in synchronization to other needs like- removing rural-urban digital divide, linking knowledge with entrepreneurship. Life after COVID-19 would demand detaching education from degrees, or placing creative tasks based on certified procedures as a substitute for many shortcomings of life & economy after lockdown is lifted.

Further, Supranational governance in order to correct past injustice can be an option here, to let every national government place - 'one world, safe health' - under their emergency powers. Situating pandemics under the purview of disaster management for any nation fails to achieve meaningful coordination amongst various stakeholders, tackling public misinformation, amongst others. Nations must think about mechanisms of amendments in their respective emergency provisions, disaster management, epidemics act and due harmonization of it in foreign affairs, legal, information technology discourse.

### **Changes/ Amendment needed or Introduction of New Policies**

The drafting of legal readjustments was relating to different sectors which ranged from the banking sector and financial sector to education as well as the food department (Agrawal, 2020). There have been changes made by the government in different sectors as listed below:-

**Education Sector:** The CBSE board has told that the exams will not be conducted in external centres but will be done in students' respective enrolled centre. However, the board has provided options to change the districts and even states if the students are out of the station and unable to reach their home centre due to the COVID 19 effect. This is because of the fact that many students were stuck in different places and were not able to attend their related centre. The digital learning will help to maintain social distancing, and the government has taken the initiative for the same (Government, 2020).

**Banking Sector:** In the banking sector, the policy of lending rate was changed where there was a cut down of the repurchase rate by 75 basis point. However, there

was seen a slash down of the effective rate of deposit by 115 basis points. This step was taken by the government so that the lenders cannot play safe and only keep the money with RBI (Economicstimes, 2020). This decision was taken so that business people at this difficult time can avail easy cash and continue their business.

**Health and Environment Sector:** In the Environmental Health and Safety (EHS) the central and the Maharashtra government together had made two new changes, first one relates to the waste disposal process, guidelines on the collection methodology of wastes and also its transportation method. The other change was related to the validity period consent extension from the Maharashtra Pollution Control Board of all kinds of biomedical waste management. This was done in order to ensure that the spread of virus does not occur from these wastes and also through the transportation system.

**Finance and Taxation Sector:** In the sector of Finance and Taxation, the Central Board of Indirect Taxes and Customs had exempted all kinds of customs duty on the face and surgical masks, ventilators, equipment related to personal protection and any types of kits that were related to COVID 19 (Agrawal, 2020). This was done so that the burden of tax is not imposed on the people as the people were not able to go to work.

**Labour Sector:** There were also major changes related to labours where the Rajasthan government and the Boilers Inspection Department made amendments for the factories by extending the working hours from 8 to 12 for three months and the additional 4 hours will be calculated as overtime. The Madhya Pradesh Government also made changes which said, there will be no deduction of salaries while the factories are closed. This was done because of the lockdown the labourers will have no work and money, and they will face difficulty to buy their basic needs. There are different types of initiatives of legislative, administrative and e-governance taken by the government to reform the labour law (Labour, 2020).

### **Conclusion**

After the announcement of the lockdown, the government of India had made different kinds of changes to the law, all the rules and regulations of carrying on businesses across the country. The modifications that were done had come through tools like 'notifications', 'ordinances' and also through guidelines. In order to cope up with the COVID 19 situations, the government of India had changed the old polities of any kind of physical classes and activities in school and had drafted different readjustments which are related to COVID 19 so that both business houses, as well as the common people, get benefited.

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# An Economic Analysis of Electricity Consumption in Kerala with Special Reference to Kalamassery Municipality

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## Abstract

*A day without electricity is unimaginable for the populace of today. Electricity is the driving force of the thriving economic activities around us. The deficiency of electrical energy can open a Pandora's box of troubles for Kerala which is already lagging behind in industrial development in the country. The present study makes use of both cross sectional and time series data to analyse the generation and consumption of electricity in Kerala by calculating the compound annual growth rates and instability indices of various significant variables in electrical energy sector. The study also analyses the residential electricity consumption pattern of Kalamassery municipality by using Ordinary Least Square (OLS) estimation.*

**Keywords:** Electrical Energy, Growth, Instability, Consumption Pattern.

## Introduction

Energy is an essential economic infrastructure required for a country or a region for accelerating its economic as well as its human growth. A reliable and sustainable energy supply is much needed for generation of income, employment and growth of any region. According to the Central Electricity Authority sources, India has an installed capacity of 329226 MW as on 31.08.2017. Kerala, the southernmost state of India with a population of 3.48 crores has an installed capacity of 2961.11 MW as on 31.03.2017. Kerala State Electricity Board Limited (KSEBL) has accumulated Rs.11035.88 crores as total revenue from the sale of power. Kerala has made the tremendous achievement of being the first state in India to have all its households electrified by May 2017. The total electrification of all the households in the state is a remarkable achievement when considering the fact that there are villages in India striving hard to get fully electrified.

Kerala State Electricity Board (KSEB) was a statutory body constituted in 1957 under section 5 of the Electricity Supply Act 1948 for the coordinated development of generation, transmission and distribution of electricity in the state. The assets, liabilities, rights and obligations

of KSEB which was already vested into the state government, were re-vested to new successor entity Kerala State Electricity Board Limited (KSEBL) in 2008<sup>[2]</sup>.

The major source of power generation in Kerala are hydel, thermal, Wind and Solar. The total installed capacity of power in the state as on March 2017 was 2961.11 MW of which hydel contributed a major share of 2107.96 MW (71.19%); while 718.46 MW was contributed by thermal projects; 75.42 MW from solar and 59.29 MW from Wind projects. Electrical energy consumption in Kerala has increased to 20453 MU in 2016-17 from 19325 MU in 2015-16. As per the 19<sup>th</sup> electric power survey by Central Electricity Authority, state is expected to have an increase of 60 per cent in domestic consumption of energy by 2026-27.<sup>[4]</sup>

Kerala had been an 'energy surplus state' till 1983 and used to export electricity to other states but since 1983 Kerala became an energy deficient state depending heavily on its hydro system for its electricity needs. KSEB had a past of restricting the internal demand by underinvesting in transmission and distribution networks as well as keeping the supply voltage low. Electricity generation in Kerala heavily depends on the availability on monsoons and the recurring power



shortage is a major obstacle for the industrial growth and economic development of Kerala. <sup>[5]</sup>

### Objectives of the study

1. To provide an overview of the generation and consumption of electricity in Kerala.
2. To estimate the growth and instability in the generation and consumption of electricity during 2006 to 2017.
3. To estimate residential consumption pattern of electricity in Kalamassery Municipality in Kerala
4. To suggest appropriate policy recommendations.

### Methodology

The study made use of both cross sectional and time series data for analysis. Cross sectional Data is collected randomly from Kalamassery municipality of Kerala to analyse residential consumption pattern of electricity while time series data is collected from the budget estimates and Power Statistics of KSEBL. Regression analysis is worked out to find Compound Annual Growth Rate (CAGR) of various significant variables in the sector. Instability analysis is done with Coefficient of Variation (CV) and Cuddy Della Valle (CVD) index. The regression analysis in the study is done with the open source econometric software Gretl0 2019c.

### Compound Annual Growth Rate (CAGR)

$$Y = a b^t e \quad (1)$$

$$\widehat{l}_y = \widehat{\beta}_1 + \widehat{\beta}_2 t \quad (2)$$

$$CAGR = (\text{Antilog of } \widehat{\beta}_2 - 1) 100 \quad (3)$$

### Instability Analysis

Instability analysis in this study is done in two ways.

$$\text{Coefficient of Variation (CV)} \quad (4)$$

$$CV = \frac{\text{STANDARD DEVIATION}}{\text{MEAN}} * 100 \quad (5)$$

Cuddy-Della Valle (CDV) index

$$CDV = CV * \sqrt{1 - r^2} \quad (6)$$

$r^2$  is the adjusted R squared of Eq. (2)

Cuddy Della Valle index was developed by John Cuddy and Della Valle for measuring instability in time series data. Coefficient of Variation is a good measure of instability but while analysing time series data involving trends, Cuddy Della Valle is a better indicator of instability as it is inherently adjusted for trend often observed in time series data <sup>[3]</sup>

### Result analysis and Discussion of CAGR, CV and CVD of Variables.

The study made use of time series data of different variables significant to electricity consumption in Kerala during the period from 2006 and 2017 as shown in table 1 for the analysis of Compound Annual Growth Rate, Coefficient of Variation and Cuddy Della Valle indices.

Table 1. Data on Various Significant Variables in Electrical Energy Sector of Kerala

Year	Installed Capacity	Annual Energy Requirement	Own generation	Power Purchase	Total Sale	Per capita consumption	Number of consumers	Total Revenue
2006	2650.41	13567.99	7554.1	6700.5	10905.7	314	82.95	3367.3
2007	2662.96	14695.17	7695.1	8149.84	12377.9	345	87.14	4009.71
2008	2676.66	15442.73	8647.7	8074.62	13396.6	366	90.34	4696.95
2009	2744.76	16357.16	6440.4	9628.87	12877.7	375	93.63	4893.02
2010	2752.96	17350.02	7189.5	10204.21	14025	420	97.43	4747.17
2011	2869.56	17807.77	7360	10512.27	14678.1	436	101.28	5198.52
2012	2878.36	19521.41	8289.9	11263.21	16181.6	478	104.58	5593.02
2013	2881.22	20736.19	5334.3	14908.82	16839.3	499	108.07	7223.39
2014	2891.72	21264.51	8163	14070.42	18885.5	516	111.93	9974.18
2015	2835.63	22040.04	7286.9	15031.71	18788.8	541	114.31	9879.34
2016	2880.18	22944.45	6739.3	16448.36	19513.8	569	116.68	10487.7
2017	2915.8	23849.54	4325.1	19734.93	20502.2	592.43	119.95	11035.9

Source: Power Statistics 2017 KSEBL

The growth and instability analysis of the above time series data produced interesting findings which are summarised in table 2.

**Table 2. Comparative Analysis of CAGR, CV and CVD (2006-2017)**

	CAGR(%)	CV(%)	CVD (%)
Installed Capacity	0.89	3.54	1.59
Annual Requirement	5.25	18.2	2.1
Own Generation	-2.79	17.5	15.7
Power Purchase	9.4	32.7	6.2
Total Sale	5.73	20.1	3.5
Per Capita Consumption	5.91	20.3	2.5
Number of Consumers	3.4	11.9	1.2
Total Revenue(crores)	11.76	41.6	10.75

Source: Computed from data.

The comparative analysis of Compound Annual Growth Rates of various variables used under study sheds light on interesting findings. CAGR of the installed capacity of electricity generation in Kerala over the period from 2006 to 2017 registered 0.89% of growth. But at the same time the annual requirement of electrical energy grew at a rate of 5.25% for the same period. The per capita consumption and the number of consumers also grew at 5.91% and 3.40 % respectively. The total sale of electricity has increased at 5.73% but interestingly its own generation of electrical power registered a decline by 2.79%. KSEBL compensated this decline by increased purchase of power and the study reveals that power purchase grew at 9.4% during 2006 to 2017. The total revenue registered the highest growth rate of 11.9%. This remarkable increase in revenue may partly be attributed to the inflationary effect

While looking at the Coefficient of Variation (CV) and Cuddy Della Valle (CDV) Indices for measuring instability, the study finds that the greatest instability in terms of CV is in total revenue with 41.6% and the lowest in installed capacity with 3.5%. But considering the CVD indices, the study finds that the greatest instability is for own generation of power by KSEBL with the value of 15.7% and the lowest instability in terms of CVD index is for number of consumers with a value of 1.2%. It is to be noted that the greatest instability in terms of CV for total revenue may be because of considering the nominal values without discounting for the impacts of inflation.

### Analysis and Discussion of Residential Consumption Pattern of Electricity in Kalamassery

Kalamassery municipality is an industrial hub of Ernakulam district of Kerala. Multiple regression analysis is done to analyse the impact of monthly income, number

of electrical appliances at the household and number of inhabitants at the household on the residential electrical consumption pattern in Kalamassery municipality.

The dependent variable is electrical bill (ELECTRBL). It is used as a proxy to measure the household consumption of electrical energy. The significant independent variables are monthly income of the household (MONTHLY\_INC), number of electrical appliances at the household (N\_ELECAPLNS) and number of inhabitants in the household (N\_INHABT).

The Regression Equation is

$$\widehat{ELECTRCBL} = \hat{\beta}_2 \text{MONTHLY\_INC} + \hat{\beta}_3 \text{N\_ELECAPLNAS} + \hat{\beta}_4 \text{N\_INHABT}$$

$$ELECTRCBL = 1956.77 + 0.0322 \text{MONTHLY\_INC} + 147.68 \text{N\_ELECAPLNAS} + 260.38 \text{N\_INHABT}$$

**Model: OLS, using observations 1-50**

Dependent variable: *ELECTRCBL*

	Coefficient	Std. Error	t-ratio	p-value	
Const	-1956.77	829.219	-2.360	0.0226	**
Monthly_inc	0.0321736	0.00340297	9.455	<0.0001	***
N_electappln	147.683	57.7117	2.559	0.0139	**
N_inhabtns	260.387	140.333	1.856	0.0699	*
R-squared	0.824296	Adjusted R-squared	0.812837		
F(3, 46)	71.93475	P-value(F)	2.14e-17		

From the multiple regression model, it is evident that all the three explanatory variables are statistically significant. The null hypothesis that monthly income, number of electrical appliances and number of inhabitants do not affect electrical bill which is a proxy for the electrical consumption is rejected.

$$H_0: \beta_2 = \beta_3 = \beta_4 = 0$$

$$H_1: \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$$

The alternative hypothesis is not rejected which means that all the explanatory variables are statistically significant. The p values of all the independent variables are less than 0.05 implying the statistical significance of the explanatory variables. From the R squared it is clear that 82% of the variations in the dependent variable are explained by the independent variables. To be specific 82% of changes in electricity bill is caused by these three explanatory variables as per our sample estimates. The F value is 71.935 which is far greater than the critical value of F at (3,46 degree of freedom and 5% level of significance). The F value of 71.935 > The critical F value of 2.80684. The P-value (F) is far less than 0.05. Hence there is overall significance of the model. It again shows the statistical significance of the explanatory variables in the model.

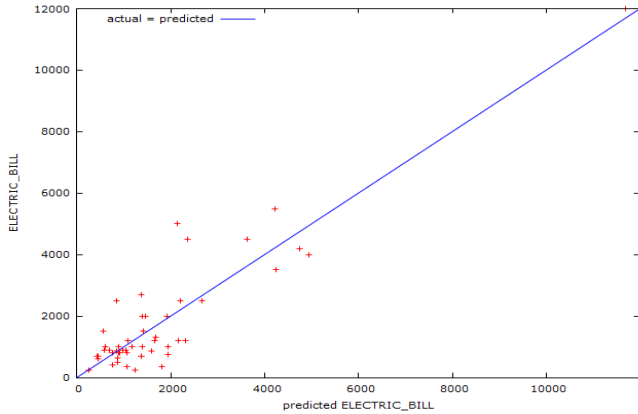


Figure.1 Actual vs Predicted Electricity Consumption.

**Analysis of Residual Plots to detect Heteroscedasticity**

The analysis of the residual plots against various explanatory variables do not exhibit any patterns thereby concluding that there is no problem of heteroscedasticity.

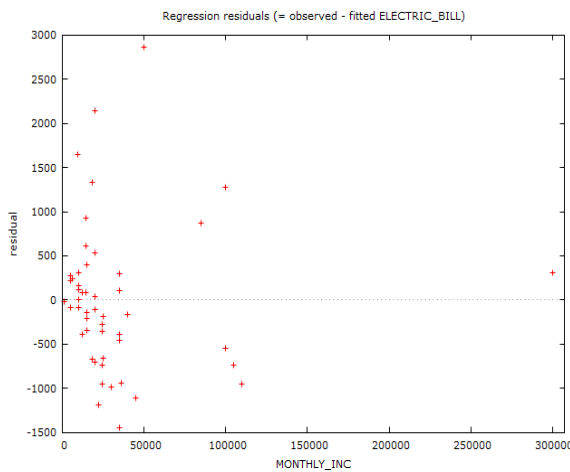


Figure 2. Residual vs Monthly Income

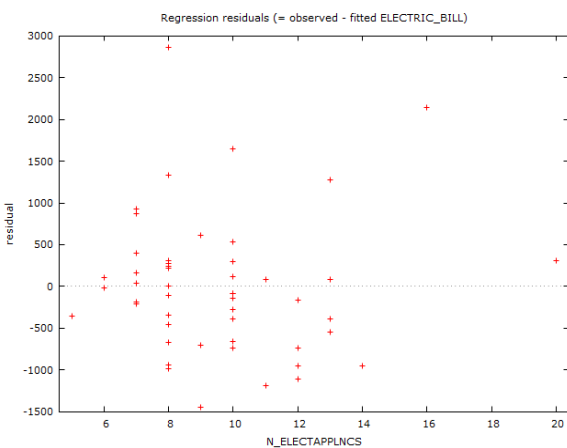


Figure 3. Residuals vs Electrical Appliances

Apart from analysing the residual plots to detect heteroscedasticity, Breusch-Pagan test and White test are conducted and their results are given below.

**Interpretation of Breusch-Pagan Test**

While applying Breusch-Pagan test, the null hypothesis is that there is no heteroscedasticity. Dependent variable  $uhat^2$  is not explained by any of the independent variables. If test statistics LM is greater than critical chi square value, then null hypothesis of homoscedasticity is rejected. But in this case the test statistics LM is less than that of critical value of chi-square.

Test statistic LM=3.019

Critical value of chi square = 7.81473

3.019 is less than 7.81473 which indicates that null hypothesis is rejected and there is homoscedasticity.

**Breusch-Pagan test for heteroscedasticity**

OLS, using observations 1-50

Dependent variable: scaled  $uhat^2$

	Coefficient	Std. Error	T-ratio	P-Value
Const	-1.22282	1.97952	-0.6177	0.5398
Monthly_inc	-1.65709E-06	8.12362E-06	-0.2040	0.8393
N_electapplnCS	0.113584	0.137770	0.8244	0.4139
N_inhabtnTS	0.251179	0.335004	0.7498	0.4572

Explained sum of squares = 6.03847

Test statistic: LM = 3.019236, with p-value = P (Chi-square (3) > 3.019236) = 0.388669

**Interpretation of White’s test for heteroscedasticity**

While applying White test, the null hypothesis is that there is no heteroscedasticity. Dependent variable  $uhat^2$  is not explained by any of the independent variables. If test statistics LM is greater than critical chi square value, then null hypothesis of homoscedasticity is rejected. but in this case the test statistics LM is less than that of critical value of chi-square.

Test statistic  $TR^2$  =11.87

Critical value = 16.919

11.87 is less than 16.919 which indicates that null hypothesis is rejected and there is homoscedasticity.

**White’s test for heteroscedasticity**

OLS, using observations 1-50

Dependent variable:  $uhat^2$

	Coefficient	Std. error	T-ratio	P-value
const	-1.35815e+07	9.98484e+06	-1.360	0.1814
MONTHLY_INC	119.333	69.8273	1.709	0.0952 *
N_ELECTAPPLNCS	-211882	789678	-0.2683	0.7898
N_INHABTNTS	5.52991e+06	3.22219e+06	1.716	0.0939 *
sq_MONTHLY_INC	0.000215454	0.000214355	1.005	0.3209
X2_X3	-9.51667	5.28844	-1.800	0.0795 *
X2_X4	-4.67986	8.93173	-0.5240	0.6032
sq_N_ELECTAPPLNCS	34997.9	29837.8	1.173	0.2478
X3_X4	-31158.4	127752	-0.2439	0.8086
sq_N_INHABTNTS	-521992	311135	-1.678	0.1012

Unadjusted R-squared = 0.237356

Test statistic:  $TR^2 = 11.867775$ , with p-value =  $P(\text{Chi-square}(9) > 11.867775) = 0.220867$

### Detection of Multicollinearity

Multicollinearity is tested by applying variance inflation factors (VIF) and it is found that values are significantly less than 10 indicating no multi collinearity.

Variance Inflation Factors

Minimum possible value = 1.0

Values > 10.0 may indicate a collinearity problem

MONTHLY\_INC 1.673

N\_ELECTAPPLNCS 1.673

N\_INHABTNTS 1.000

### Result Analysis of Regression Output

The Regression Equation is

$$= 1956.77 + 0.0322 \text{MONTHLY\_INC} + 147.68 \text{N\_ELECTAPPLN} + 260.38 \text{N\_INHABT}$$

The above estimators of the regression equation are found to be Best Linear Unbiased Estimators (BLUE). The equation reveals that a hundred-rupee increase in monthly income of a consumer leads to Rs.3.22 increase in the electrical bill and an additional installation of an electrical appliance leads to an increase of Rs.147 to electrical bill and an addition of an inhabitant leads to an increase of Rs.260.38 to the electricity bill.

### Confidence interval of estimated coefficients

Variable	Coefficient	95 confidence interval
const	-1956.77	(-3625.90, -287.641)
MONTHLY_INC	0.0321736	(0.0253238, 0.0390234)
N_ELECTAPPLNCS	147.683	(31.5150, 263.850)
N_INHABTNTS	260.387	(-22.0876, 542.862)

While analysing confidence interval of the coefficients, it is evident that coefficient of monthly income fares better than those of number of electrical appliances and number of inhabitants. By accumulating large samples, the confidence interval of coefficients can be improved and true estimates of coefficients can be calculated.

### Recommendations of the study

The study analysed the major determinants of electrical consumption pattern in Kalamassery municipality. The analysis of the sample revealed interesting finding and based on these finding the study makes the following recommendations.

- 1) In the context of improvements in the Gross Domestic Product of the country and improvements in the per capita income of the people, it is inevitable that the electric energy consumption will get accentuated and the growing requirements of electrical energy has to be met and the priorities of the government should be aligned to these objectives of the nation.
- 2) The state government and KSEB must involve in awareness activities among the public to reduce the consumption of electrical energy as the current tariffs of electricity acts as a negligible deterrent on the consumption of electricity. Hence the government needs multi-pronged strategies to make reductions in electricity consumption which is getting scarcer day by day. As 71 per cent of electricity generation is from hydel projects, its generation is monsoon dependent. Water resource once was plenty in Kerala and now becoming a scarce resource is a worrying signs of imminent crisis in power sector.
- 3) It is high time that KSEBL makes a serious thinking on making substantial investments on other sustainable alternatives of electricity generation like solar and wind projects. Diversification can help in boosting dwindling own generation of electricity by KSEBL.



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# Understanding Culture Promoting Preference of Sons Among Women of Kakrala Village, Punjab

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## Abstract

*Despite major strides made in several parameters related to women and their empowerment, the culture promoting preference of sons remains undiminished. For decades, female subordination and gender discrimination have regrettably remained as impediments to women's social, cultural, and economic growth. Punjab, popularly known as 'Nation's Basket' is characterized by strong patriarchal norms and inherent gender inequalities. While the state has the most equitable model of development, it also has the lowest sex ratio. Contrary to the biological pattern, there have been a lesser number of women than men in Punjab. Punjab has been consistent in maintaining a skewed sex ratio since the first census in 1881, with a sex ratio of 844. As per census 2011, it remains at 895 with the Indian average at 943. Girl child discrimination is reflected with a Child Sex Ratio (CSR) of 846, which is taken as a consolidated reflection of mortality in the most vulnerable age group. The continuing practice of male child preference manifests as cultural neglect of the girl child and also provides social acceptability and justification to female infanticide and prenatal sex selection, both of which are crimes in India. Based on secondary sources and primary data, this paper will focus on the deeply rooted gender bias against girl children in village Kakrala. By elucidating the culture and practice of male child preference through using narratives from the field, this paper will argue for a more comprehensive and holistic approach towards ensuring gender equality that goes beyond developmental indicators and questions the challenge that still exists towards the right to life for girl children.*

**Keywords:** Gender, Culture, Women, Patriarchy, Punjab

## Introduction

India has made rapid progress in the overall socio-economic development and that has significantly improved maternal and child health, better education, improved economic opportunities, especially for women, and reduced literacy gaps between men and women. But this trend of development has not yet resulted in equalizing sex ratios in general and gender relations in particular (Ahlawat, 2016). According to the World Economic Forum (WEF) Gender Gap report, India has slipped down to 112<sup>th</sup> position from the 108<sup>th</sup> position in 2018 (World Economic Forum, 2020). As per census 2011, there are 940 females per 1000 males in India which reflects the griming situation of girls as well as the occurrence of sex-selective abortion practices. At the same time, Child Sex Ratio (CSR) has declined from 927

in 2001 to 914 in 2011 which is further a cause of serious concern. These numbers highlight that there is persistent discrimination against girl child and that achieving gender equality might still be a far fledged dream for our nation. These numbers also indicate that despite higher levels of education, awareness, and economic prosperity that our nation has achieved over a few decades, the consciousness and attitudes of people towards women and girls have not changed.

For decades, female subordination and gender discrimination have regrettably remained as impediments to women's social, cultural, and economic growth. Research studies have shown that lack of gender equality translates to outcomes such as poor health, poor education, and limited access to resources for women. The neglect and discriminatory behavior

towards girls leading to excess female mortality have been widely documented (Visaria, 1971; Dasgupta, 1987; Miller, 1989; Kishor, 1995, as cited in Ahlawat, 2016, p.2). India has a history of more women and girls dying than men through their childhood and reproductive age. Gendered practices and norms are deeply embedded within the social fabric of our society and they not only subjugate women in every sphere of their lives, but also condition them to internalize these practices and norms. It is considered to be the prime responsibility of the women to impart these roles and practices to their daughters and daughters in law. In a patriarchal family set up, young girls while growing up are often encountered with phrases such as 'You are a woman, you are supposed to do this' or 'You are a woman, you are not supposed to behave like this'. Women are taught to be submissive and tender right from their childhood so that they are properly 'adjusted' in their families once they are married. Women are socially conditioned and their gendered identities are constructed around them so much so that more often than not, women themselves become torchbearers of patriarchy. As rightly argued by Bhargavi V, 'The discriminatory socialization of children based on gender plays a special role in preparing the female psyche for subservience.' (2008, p.398).

### **Review of Literature**

Though the situation of women in our society in recent years has improved due to numerous awareness drives and social campaigns such as 'Beti Baccho, Beti Padho', but there is a long way to go as far as gender equality is concerned. At the center of gender discrimination discourse, is the phenomena of son preference. Despite major strides made in several parameters related to women and their empowerment, India's obsession with a male child and their significance has not diminished. Son preference in India is ancient and universal. It is an indicator of social development (Radkar, 2016). There are a plethora of social, cultural and economic factors that contribute to this skewed preference. There has been enough and more research on understanding the cause of this preference and the main reason emphasized by social scientists has been the patriarchal social set up and its implications on the position of women in our society. Many studies carried out since the 1970s have shown how cultural practices have always undervalued daughters or women in Indian society (Ahlawat, 2016). Cultural norms and rituals celebrating the birth of son are practiced and observed across all sections of our society. There is a social and economic value being assigned to a male child. Birth of a son is supposed to give a higher social status to the family, especially the mother, as well as it is considered as a step forward towards economic prosperity. A boy in the family is

viewed as an investment and future breadwinner while the daughters, on the other hand, are seen as liabilities and are eventually married off to their 'real' families on paying heavy amounts of dowry. There is always a feeling of remorse associated with the birth of a girl child, especially for second or third daughters. They are even less breastfed than their brothers and have limited or little access to good food, medical care, and education as compared to their male counterparts. Moreover, a family is never 'complete' unless they are blessed with a son. It is often considered as a burden to raise young girls as the concept of shame and honor are associated with them. There is a strong emphasis on their purity and virginity and girls are told to behave in preconceived and socially constructed norms. A lot of importance is attached to the onset of menstruation in young girls because it is an indication that the girl is not barren and will reproduce once married hopefully, sons.

"India's story of economic development has not translated into corresponding gains in the social sphere and this paradox is indicative of how development can be a misnomer if it does not change unjust cultural thought and practice" (Ahlawat, 2016, p. 1). Gender discrimination in recent years has taken newer forms and manifestations. The lives of daughters who are born are improving, but they are still not wanted. The level of education among girls and women is increasing, their ultimate goal still revolves around marriage and children. There is not necessarily a direct correlation between economic advancement and reduced gender inequality. It is reported that neglect and discrimination against girl child and son preference are more pronounced in areas that are economically advanced due to massive privatization and availability of sex-selective technologies. Many studies have reported that there is a direct relationship between skewed sex ratio and economic prosperity and availability of technologies for sex selective abortion as well as infanticide. These practices are more dominant among people with higher education and higher incomes. For example, Punjab, one of the richest states of our country, has the worst child sex ratio amongst the other states. The state has recorded a long history of female infanticide and male child preference. With the new trend of having small families, people are strategically choosing to have sons over daughters. Economic survey (2018) reported that 'India could have as many as 21 million unwanted girls, that is, girls whose parents wanted to have sons instead' (Thomas, 2018). The same report also estimated that many Indian parents are opting to have children till they have the desired number of sons. Families keep on trying until they have a son and that manifests in deeply rooted discriminatory practices against the girl child, especially the second or child one.

## Objectives and Research Methodology

This paper aims at understanding the culture promoting preference of sons and the deep-rooted gender bias against the girl children in village Kakrala, Punjab. By elucidating the culture and practice of male child preference, this paper will argue for a more comprehensive and holistic approach towards ensuring gender equality that goes beyond developmental indicators and questions the challenge that still exists towards the right to life for girl children. Through reviewing specific indicators related to women and their empowerment, it attempts to locate gender discrimination within everyday occurrences of their lives, social beliefs, and patriarchal norms. Besides the secondary sources of information, the argument made in the paper is also authenticated by primary data which was collected by the author during her doctorate field research in Village Kakrala of Patiala District, Punjab. In-depth interviews were conducted with 125 women of the village and those relevant are stated in the paper.

## Punjab and Gender-Specific Challenges

Punjab the 'land of five rivers' has always held an iconic status in the history of the country. Punjab, the home of the Green Revolution, is known for its rich and composite culture. It is one of the top income states of our country and has served as a role model of development for other Indian states. Green Revolution during the 1960s has been instrumental in accelerating the economy of the state and establishing it as one of the richest states of our country. The state is known as 'Nation's Basket' the largest producer of food grains contributing one third to the central pool of food grains, thereby, rendering its importance for maintaining the food security of the nation. Agriculture has played a significant role in making the state one of the prosperous states and the economy since the 1960s has been growing at an annual rate of 5 percent.<sup>1</sup> No other Indian state has the distinction of growing at a rate of 5 percent spread over the last 50 years and has simultaneously very impressive track record on account of equity.<sup>2</sup> Though, after 2005, the growth rate in the state has been lower than the national average (World Bank, 2017, p.1). Although due to this kind of growth model, there were faster reductions in the number of people living below the poverty line and only 8 percent of people in the state are living below

poverty line and are amongst the lowest in the country<sup>3</sup>. But there are paradoxes in the development in the state.

The state of Punjab is characterized by strong patriarchal norms and thus struggles with gender discrimination which is often reflected in the skewed sex ratio of the state. Sex ratio for the state stands at 895 (census, 2011) which is among the worst in the country and is much below the national average of 940. It is disturbing that the state of Punjab has been struggling with a skewed sex ratio since many decades now and it has remained consistent in this imbalance since the first census in 1881 with a sex ratio of 844 (Department of Planning, Punjab, 2017)<sup>4</sup>. This number has drastically improved from 793 in 2001 to 875 in 1991. Even after this progress, the number does reflect a grim picture of the state of women and girl child and their low status in the state.

**Table No 1: A Comparison of Sex Ratio in Punjab and India**

Year	Sex Ratio (Punjab)	Sex Ratio(India)	Percentage Difference <sup>1</sup> (%)
1951	844	946	11
1961	854	941	9.2
1971	865	930	7
1981	879	934	6
1991	882	927	5
2001	876	933	6
2011	895	943	5

Source: *Women and Men in India, 2018*

The above table reflects the pattern of sex ratio in Punjab and India. From the table, it can be comprehended that there have been improvements in the state in terms of increasing the sex ratio every decade. The percentage difference in the sex ratio of Punjab and India has shown a decreasing pattern from 11 percent in 1951 to 5 percent in 2011. But still, the state lags in terms of the national average. There have been over 2 percent improvement over the last ten years in the state, which a cause of serious concern. The girl child sex ratio (CSR), which is considered to be a cumulative indicator for gender inequalities and discrimination since birth, mortality at

1 Government of Punjab Department of Planning Punjab.(2017).Punjab Vision Document 2030. Institute of Development and Communication.Chandigarh

2 Ibid

3 World Bank. 2017. *Punjab - Poverty, growth, and inequality (English)*. India state briefs. Washington, D.C. : World Bank Group.

4 Government of Punjab . Department of Planning Punjab.(2017).Punjab Vision Document 2030. Institute of Development and Communication.Chandigarh

5 Percentage Difference manually calculated



birth, and accessibility of the health services by the most vulnerable age group, stands at 846 while the national average being at 919. Moreover, this number decreased from 901 in 1961 to 846 in 2011. Adverse sex ratio reflects the confluence of many socio-cultural factors: inherent gender discrimination, continuing strong son preference, and the combination of declining family size preferences and unchanging demand for sons, the easy availability, in practice, of technology that enables fetal sex determination and the apparent difficulty in enforcing laws prohibiting the revelation of fetal sex (Shireen J. Jejeebhoy, 2014). The girl child missing rate in Punjab is 11084 which is much higher than the national average of 3328 (Department of Planning, 2017, p. 353). Furthermore, the trend of a poor female work participation rate (FWPR) also highlights the inherent gender inequality in the state remaining at 13.9 percent, which is much below the Indian average of 25.51 and is amongst the lowest in the country. On the contrary, the male participation rate stands at fifty-five percent which is higher than the national average of fifty-three percent (Department of Planning, 2017). Furthermore, the status of anemia among adolescent girls and women is alarming in the state. According to NFHS-4, more than half the women in the state (53.5 percent) are anemic and the comparison between NFHS-3 (2005-06) and NFHS-4 (2015-16) shows that the percentage of anemic women has increased by more than 15 percent over ten years. One might raise a question that despite being one of the most developed states of the country and having better health facilities as compared to other states, why is it that more than half of its women are still strangling in the chains of anemia. This health issue is not just nutritional and poverty-related. Socio-cultural beliefs such as putting family first, offering their husbands the best of everything including food, and the practice of eating last often result in deterioration in women's health. Most women are discouraged to make decisions for them, including the kind of food they want to consume.

**Table No 2: A Comparison of Child Sex Ratio (CSR) of India and Punjab**

Year	Punjab	India
1961	901	976
1971	901	964
1981	908	962
1991	875	945
2001	798	927
2011	846	914

Source: *Women and Men in India, 2018*

Punjab has been performing quite well as compared to other states as far as women's health and its specific indicators are concerned. Maternal Mortality and Infant Mortality rate for the state is 122 and 21 (SRS, 2014-16) respectively, both of these indicators fall much below the national average. Antenatal checkups (ANC) indicators for the state such as 3 ANC checkups, PNC visits, institutional deliveries, etc are better than the national average (HMIS-NHSRC, 2015-16). But there is a need to look beyond these indicators to have a nuanced understanding of the existing scenario of women's health and women's position in the state.

The occurrence of anemia among women and young girls in Punjab is very disturbing. According to NFHS-4, close to fifty-four percent of the women in the state are anemic and the comparison between NFHS-3 (2005-06) and NFHS-4 (2015-16) shows that the percentage of anemic women has increased by more than fifteen percent over ten years, as it is clear from table number 1 mentioning the incidence of anemia among women and girls in Punjab that is given below (International Institute for Population Sciences, 2015-16). The National Family Health Survey-3 data reported that close to fifty-five percent of Indian women were anemic and twenty-four percent were Indian men and the state that performed the worst throughout the country was Punjab. Data from the District Level Household and Facility Survey conducted between 2012-2013 suggested that anemia in the state was widely prevalent among all age groups and was particularly high among pregnant women marking the rate up to fifty-eight percent. NFHS-4 data also estimated that around fifty-four percent of adolescent girls in the state had anemia, which is a much serious concern for the state as young girls even before entering the motherhood phase are already anemic. More so, these numbers must be underreported.

**Table No 3: Incidence of Anemia in Punjab among women and girls**

Indicators	NFHS-3 (2005-06)	NFHS-4 (2015-16)
Women who are not pregnant aged 15-49 years	37.9	54.0
Women who are pregnant aged 15-49 years	41.6	42.0
All women aged 15-49 years	38.0	53.5
Adolescents girls who are anaemic(15-19 yrs)	43 (DLHS 4)	58 (NFHS 4)

Source: *Reports of National Family Health Survey (NFHS) 4- Punjab and National Family Health Survey (NFHS) 3-Punjab*

### Son Preference in Village Kakarla, Punjab: Narratives from Women

To understand the preference of sons and inherent gender inequalities, in-depth interviews were conducted with women of Kakrala village on the significance of sons in their lives. There is a lot of scholarly work on the linkage of women with nature and men with culture which reflects the reality of our society. But even the women think that their roles, their tasks, their products are not at par with those of their men. 'Men have to earn money. That is tougher. What we do back at home is easy, cook food, take care of babies, clean house. That's all. We stay back at home. Our work does not bring money. Maybe what you do get you money. But not ours. It is not work'. Thus, there is a universality of female subordination, not just by men, but by women themselves.

'When and how do you come to realize that this is what is expected of you?', was the question. They replied, 'what is there to learn, I have been taught since birth that I have to take care of younger siblings, and later on when I grow up, my husband and his family. It is out there. Nobody teaches these things to you. Even you must be taking care of the male members of your family. You are a woman. You are made to do this. Take care of everyone. What is so new about it! I have seen my mother thinking about herself after everyone else and even here, I do the same. I should think about myself only if everybody in the family has been taken care of. My wishes and desires are always last.' 'A female body knows its role. You don't teach anything. It is made to do all this. I got married last year. My parents thought it is the right thing for me. Before that, I was constantly told by my mother to keep my body safe for my husband. I was taught to impress everyone at my natal home by my work and to always keep them happy. I was also advised not to sit at the same level as my husband; you should always sit at a place lower than him.'

The women regard their work to be inferior and less valued than that of men. Also, there is an inherent common thought existing among the women that they attain social status only when they are married and have children, preferably sons. The attainment of respect and social status is only through being somebody's wife and a mother of a male child. The preference of sons over daughters is one phenomenon that is very deep-rooted among the women of Kakrala village. It is necessary to have a son. From their conversations, it was clear that having a son not only gives them respect in society, but also within their families. As one of the women who had just given birth to a son explained the importance of having a son, 'I have 3 daughters also. But having a son is a necessity. Husband will keep on blaming me for not giving him an heir, even the in-laws. I also wanted

respect within the village. I will get it through my son only and women get status only when they become wife's and mothers of a son'.

On discussing the importance of having a son with an old and experienced woman in the village, the author got very interesting reasons. She explained, 'See, whatever wealth and property I have made will go waste if I don't have a son. Daughters are supposed to get married and make their own family. Sons will be our support when we get old. On not having a son, a woman will never be happy herself because she will be made to feel unwanted from her family and even society'. Another woman expressed, 'a lot of money is spent if you have a daughter. We have to save money throughout our lives for a daughter's dowry ritual. They say *Ladki hoti hai to ek muthi choti ho jati hai* ( With a girl's birth, one fist gets smaller). That means wealth from your house goes away, whereas, with son, wealth comes in the house.' 'It is necessary to have a son, very important. Who will do the last rites and rituals when we die? We don't even get heaven if the last rites are not paid by our sons. Son is needed. We don't get *moksha* (Salvation)'

Thus, having a son not only brings respect in society but also wealth and prosperity. Birth of a son is seen as a sign of prosperity and happiness. There is a hope that sons will take care of their parents and support them financially when they are old. Also, all the rituals in Indian society are male-oriented, so if one is not having a son, he/she will be excluded from any of the rituals. One cannot achieve salvation if the last rites are not paid by a son. Daughters are married and sent off to their own houses. The want of a male child is so dominant that even women having 4 daughters or more, do not want to go for Tubectomy, with a hope that God will give them their heir. 'I have 4 daughters. But I m not going for an operation. My husband and in-laws want a son. We are not in a situation to provide proper food and education to our children, but are willing to keep trying for a son'. 'But do you want a son' was the question to her. She replied, 'Yes, why would any woman not want a son. I want to make my husband happy.' This depicts the de facto superior position of men over a woman, which is so deep-rooted and embedded.

One of the women respondents from the village explained, 'During my pregnancy, ANM suggested me to eat good meals and have tablets as my hemoglobin was very low. But I was always so stressed that whether I will have a baby boy or not. If not, I know, my life is going to be of no use'. Another woman highlighted the scenario, 'We only want a son. Wishing from god and doing whatever we can do. But many people kill their daughters once they are born. At least we are not doing this.'

It is so obvious to notice that these women know what their appropriate roles are and after a series of social structural arrangements and childhood experiences, they have sort of internalized these roles to such an extent that they don't find anything exceptional or wrong in killing their wishes and desires. The quotes such as 'you are a woman,' 'you have to keep your family happy' depict the gender differences that are culturally produced and are interpreted as being rooted in 'biology', as something that is so natural or to be more precise 'biologically determined'. According to Leela Dube, 'These social arrangements in which men and women have unequal rights, positions, and roles- both as brother and sister and as husband and wife are perceived as corresponding to the arrangement of nature which assigns unequal roles in procreation to the two sexes'. (Dube, 1988)

Such griming situation of women and girls in village Kakrala also indicates the prevalence and practice of sex-selective abortion practices. During the fieldwork, one of the male respondents, who reside in village Kakrala, said 'These tests are not being done in Public hospitals/clinics, as they are illegal. But many private clinics offer sex prediction tests. It costs 30,000 to get that test done. And then if it is a girl child, it is another 11,000-12,000 for the abortion. And everyone, poor or rich, if possible, desires to go for these tests'. On asking one of the women respondents about the prenatal tests, she informed, 'These tests are not conducted everywhere these days. Especially, not in public hospitals. But in Nabha, many private hospitals do this but charge very heavily. Those who can afford them, they do it.' Thus, the prevalence of sex-selective abortion and infanticide still exists, despite all the progress achieved by the state in all these years.

Despite being one of the most progressive and prosperous states with high per capita income and 70 percent female literacy rate, Punjab suffers from the skewed sex ratio, declining female work participation rate, and a culture promoting strong preference of sons. These figures highlight the prevailing scenario of gender discrimination and the lower status of women which is often over showed by the 'economic indicators', 'rich cultural heritage', and 'social values' of the state.

### Conclusion

In recent years, there have been massive efforts from the government in protecting girl child through social campaigns, social security schemes, improved health facilities, and improved education. And these efforts have translated into reduced maternal mortality, reduced infant mortality, increased girl child enrolment, and improved well being. But the deeply rooted culture promoting preference of sons has not improved. There has been enough and more research on the effect

of indicators such as maternal mortality rates, safer pregnancies, institution deliveries, access to health and presence of adequate health institutions on the overall health of women and how significant these indicators in determining the health status of women of a particular region. But in the case of Punjab, albeit the importance of these indicators, it is also crucial to look beyond these indicators for a clearer picture of the status of women.

On one side, the state 'Punjab' is synonymous with rich culture, tradition, folk music, fertile lands, and great food, on the other side; it is also synonymous with skewed sex ratio, gender imbalances, an alarming rate of anemia among women. In today's day and age, there is enough and more discussion around women's empowerment and achieving gender equality. India is hoping to achieve Sustainable Development Goals (SDGs) by 2030 and SDG -5 that aims to achieve gender equality in all aspects has much more far-reaching implications on all other 17 goals and is undoubtedly the most significant indicator to be achieved. The question here arises that is it possible to achieve gender equality and achieve the numbers where the most basic right of life and birth is still a challenge? Can we talk about achieving national and international goals of eliminating gender discrimination when one of the most developed states of our country is struggling with a skewed sex ratio and prenatal sex selection practices and deeply rooted patriarchal norms?

Punjab has been performing better as compared to the national average in most of the indicators such as growth rate, literacy rate, MMR, IMR, birth rate, etc which are often the parameters defining the prosperity, well being, and development of a particular region. However, there is a need to look beyond these indicators and understand the scenario in the state socially and culturally. People in Punjab are known to cherish efficient roads, good schools, one hundred percent rural electrification, schools, and health centers provide basic amenities to the people of the state which are still not available to large areas of the rest of the country (Government of Punjab, 2015, p.1). However, it would be problematic to analyze the state of development in Punjab solely based on specific indicators and parameters. There is a need to look beyond these numbers and understand the scenario that has been brewing in the state from the past two decades through a gender lens.

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