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## Research Article



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# An analytical study of socio – economic factors influencing the level of malnutrition in selected states of India

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### ABSTRACT

Human Development is closely related to health. Malnourished children are more vulnerable to infection and if not treated on time and may fall into the vicious cycle of Malnutritional-infection-Malnutrition. The primary objective of this research is to determine whether economic growth affects nutritional status or not and to understand the effect of other socio-economic factors on Malnutrition. The study has been conducted for three states namely Gujarat, Sikkim, and Bihar. Sikkim had the highest per capita Net State Domestic Product (NSDP) while Bihar had the Lowest per capita NSDP. Researchers have compared Gujarat's nutritional situation with Sikkim and Bihar using data from NFHS-4 & 5 reports. Malnutrition Index, Household Condition Index, and Women's Condition Index have been prepared and efforts have been made to measure the socio-economic factors that influence the level of Malnutrition. The results show that despite having the lowest per capita NSDP, Bihar's nutritional status is far better than Gujarat's Nutritional status. Gujarat's nutritional status is worsened in NFHS -5 as compared to NFHS-4 despite a stable Household Condition Index. This may be because of deprivation in Women Condition Index. While, a different situation in Sikkim's case is observed because despite decreasing the Household Condition and Women Condition Index, it has improved its nutritional status in NFHS- 5 compared to NFHS-4.

### ARTICLE HISTORY

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### KEYWORDS

Malnutrition Index, Household Condition Index, Women Condition Index, Socio-Economic Impact, NFHS

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## INTRODUCTION

Malnutrition refers to a condition in which the body does not receive the required nutrients, or where those nutrients are in excess. Formally, Malnutrition can be classified into two categories -Undernutrition and Overweight. Undernutrition is further divided into three parts-stunting, wasting, and underweight. Stunting refers to low height for age. Wasting refers to low weight for height and underweight refers to low weight for age. Malnutrition is one of the major global health burdens. It mainly affects the young population especially, those who are under 5 years of age. The invisible nature of Malnutrition makes it the biggest threat to children's health (Adebisi et al., 2019). Children who are Malnourished are more vulnerable to infections, and if not treated on time, fall into the vicious cycle of Malnutrition-infections-Malnutrition. Human development is closely linked to health. Optimal productivity and well-being are the product of good health. In 2017, Indian Council of Medical Research (ICMR) estimated that Malnutrition was the strongest risk factor for death in children under the age of five in every State of India (UNDP (United Nations Development Programme), 2022).

As per the Global Hunger Index (GHI) India was ranked 94<sup>th</sup> out of 107 countries in 2020 which has dropped to 101<sup>st</sup> place among 116 countries in 2021. Based on the GHI score of 27.5 out of 50 in 2021, India falls under the serious category (Grebmer et al., 2021). According to Human Development Report (HDR) 2021-22, India's rank on the Human Development Index (HDI) has slipped from 130 in 2020 to 132 in 2022. According to National Family Health Survey (NFHS-5), the proportion of severely wasted and

overweight children in India are increased by 0.3% and 1.3% compared to NFHS-4 while, the proportion of stunted, wasted, and underweight children decreased by 2.9%, 1.7% and 1.3% respectively as compared to NFHS-4. If we talk about Gujarat, according to NFHS-5, the percentage of stunting, severely wasted, underweight, and overweight have increased to 0.5%, 1.1%, 0.4%, and 2% respectively, as compared to NFHS-4. Considering the nutritional status of Gujarat in comparison with states like Sikkim and Bihar for NFHS-4 and NFHS-5, the values for wasted children are found with 26.1% and 25.1% respectively, which is highest among all the three States. Chronically stunted children are 48.3% and 42.9% for NFHS-4 and NFHS-5 respectively, found highest for Bihar state. 8.6% and 9.6% of children are found overweight in Sikkim for NFHS-4 and NFHS-5 respectively which is higher among all these three States.

Financial well-being of a Country or State is traditionally determined by economic indicators such as Gross State Domestic Product (GSDP) and Net State Domestic Product (NSDP). In general, more income leads to economic development (Haddad & Alderman, 2000). The increase in income boosts the purchasing power of the household and purchasing power of the household leads to increase in consumption of the household. In this way, health and nutrition can be considered to be a function of economic development (Ruia et al., 2018). The phenomenon of Malnutrition cannot be explained only from an economic perspective. Reviews claim that children's health status is not related to the stage of economic development (Pal & Bharati, 2007)(Ruia et al., 2018). There is a bi-directional causation between malnutrition and

poverty, which fuels each other in a vicious cycle. Through the reduction of the economic potential of the population, Malnutrition creates conditions of poverty, and poverty reinforces Malnutrition by increasing the risk of food insecurity (Siddiqui et al., 2020). A child's nutritional status is influenced by a number of determinants including food security, the educational level of their parents, necessities such as water, sanitation, and other diseases (Shashidhar et al., 2011).

This study is intended to compare state of Gujarat with Sikkim and Bihar using data from National Family Health Survey-4 (NFHS) and NFHS-5. Sikkim is the State with the highest per capita NSDP in 2015-16 and 2019-20. While, Bihar has the lowest per capita NSDP in 2015-16 and 2019-20 at constant price according to the National Statistics Office (NSO), Ministry of Statistics and Programme Implementation (MOSPI) ([www.rbi.org.in](http://www.rbi.org.in), 2021), Government of India and therefore these states are chosen for comparison with Gujarat. Reason for considering per capita Net State Domestic Product for the years 2015-16 and 2019-20 has been that both these NFHS-4 and NFHS-5 are conducted for the these same years and would be appropriate to compare. The major objective of this research exercise is to find out the link between economic growth and nutritional status and to measure the effects of household condition and other women-related social factors on nutritional status of children. For that, socio-economic situation of Gujarat is compared with Sikkim and Bihar using per capita NSDP and various health related indicators from NFHS 4 and 5.

The first part is on introduction of the study which covers some basics of Malnutrition, scenario of Malnutrition in India and Gujarat and India's ranking in various Nutrition related indices. Second section is related to literature reviews. Next section is related to methodology and analysis part of the research, and the last section deals with results, conclusion, and suggestion.

## **LITERATURE REVIEWS**

(Pal & Bharati, 2017) Aim of this study is to investigate the degree of chronic Malnutrition in the context of socio-economic and demographic characteristics of the children and their households in three States: Bihar, West Bengal, and Kerala. These three States represent the three stages of development. Kerala is one of the most developed State in India, while Bihar is one of the least developed. Results indicate that major factors that influenced the health status of the children in all three States were women's education and household condition index irrespective of the stage of economic development. (Ruia et. al.,2018) It focuses on a comparative analysis of Malnutrition with the main emphasis on Integrated Child Development Scheme (ICDS) in the two economically resurgent States namely Gujarat and Bihar. Results pointed out that Gujarat which is criticized for focusing excessively on economic growth has shown sharp improvement in combating Malnutrition. On the other hand, Bihar also exhibited impressive economic growth but still languishes at the bottom with a Malnutrition rate of 82%. They have concluded that high economic growth does not have an automatic and

immediate positive impact on alleviation of Malnutrition.

(Christian & Dake, 2021) This study examines the coexistence and correlates of household burden of Malnutrition in twenty-three countries across Sub-Saharan Africa (SSA). The results indicated that various conditions of household Malnutrition burden are associated with the age of household head, the location of household, access to improved toilet facilities, and wealth status. (Adebisi et al., 2019) This study suggested that communal education especially of women and young people is essential to improve the nutritional level. It has also recommended to improve roads, infrastructure, and information systems to enable good food availability in the Country.

(Webb et al., 2015) Using six nutrition goals endorsed by the 2012 World Health Assembly (WHA), researchers proposed a composite index that measures the state of nutrition across 89 countries. Countries have been ranked and researchers have tracked their changes over time. India placed in the second group with the highest average anemia rate. Results also pointed out that despite having a low prevalence of children overweight in India, it rates badly on all five other measures including stunting, anemia, low birth weight, exclusive breastfeeding, and wasting. (Rosenbloom et al., 2008) Researchers have used three indicators of nutritional status to calculate the Global Nutrition Index (GNI), including deficit, excess, and food security, based on the HDI (Human Development Index). A total of 119 Countries were analyzed based on the percentage

of undernourished, underweight, and dying children under five years of age. Countries have been divided into 4 parts, 1. Developed countries, 2. Countries in transition, 3. Low mortality in developing Countries, and 4. High mortality in developing Countries. Calculations have been made within four groups of Countries as well as between them. Based on HDI, GNI has been calculated and weighed equally. Scores range from 0 to 1, with higher scores indicating better nutrition. The results show that many developed countries, have poor nutritional status, like United States ranks 8<sup>th</sup> in the HDI while, 99<sup>th</sup> in the GNIg. Japan ranked 1<sup>st</sup> rank and Sierra Leone ranks 192 in the GNIg while, India ranks 96<sup>th</sup> in the GNIg rank. Researchers used a diagonal 45-degree line to compare HDI and GNI for each of the four groups of Countries. All points fall on the line if, the GNI and HDI ranks are perfectly correlated. And if a country is above the line, its nutritional status lags its growth. While, a country falls below the line, its nutritional status is worse than its development level. India is in high mortality developing country and India's rank is placed above the diagonal lines which means India's nutritional status is outranked its development stage. It is a good sign for our country, but there is concerned which needs to pay attention that India is placed in the high mortality developing countries group.

Based on the literature reviews, several economic factors and socio- individual factors have been identified as determinants of Malnutrition. A Malnutrition Index is prepared which consists of stunted, wasted, severely wasted, underweight, and overweight. This index is quite similar to the

Net State of Nutrition Index (NeSNI) which was developed based on the six indicators formally approved by the World Health Assembly (WHA) to set global targets for improving nutrition (Webb et al., 2015). NeSNI considers 6 indicators: stunting, anemia, low birth weight, overweight, exclusive breastfeeding, and wasting. While in this research, five indicators discussed above are considered. For the formation of Malnutrition Index, both undernutrition as well as overweight are included because traditionally undernutrition associated with poor resources while overweight is associated with wealth but recent observations reveals that undernutrition and overweight are increasingly co-occurring (Christian & Dake, 2021).

Child health is influenced by various individual and household characteristics. Variations in the long-term nutritional status of children can be explained by socio-economic factors, household economic situation, and women's educational attainment (Yimer, 2000). Most studies addressing this topic report that socio-economic factors are the major cause of childhood Malnutrition World-wide (Ghosh, 2020). The present study experiments with both socio-economic approaches. A Household Condition Index is prepared which consists of electricity, drinking water source, sanitation facility, and clean fuel for cooking. Researchers have also used the Household Condition Index because household conditions are important factors on children's health status (Pal & Bharati, 2007). (Kane et al., 2000) They have pointed that Malnutrition was more likely to occur in female

children, mothers who have little education, multiple siblings, and siblings born within 24 Months. Mother's age, birth interval, number of under five children are associated with stunting and number of antenatal care visits are associated with chronic Malnutrition (Yimer, 2000). It is also important to consider social factors when determining Malnutrition, as Malnutrition has been linked to young mothers and low income in Ghana during the year 1990 (Rikimaru et al., 1998). Therefore, we consider all the characteristics of mother that affect children's health. Women Condition Index consists of women with 10 or more years of schooling, women age 20 – 24 years married before age of 18 years, mothers who had at least 4 antenatal care visits and, institutional birth. All these data are in percentage. Data used for this study are taken from the NFHS-4 and NFHS-5 reports published by the International Institute for Population Sciences (IIPS). The report provides information on India's population, health, and nutrition of each State and Union Territory (NFHS-5). In this paper for assigning minimum and maximum values for construction of Indices, only 28 states of India are taken into consideration.

## RESEARCH METHODOLOGY

This research exercise consists of three indices namely-Malnutrition Index, Household Condition Index and Women Condition Index. Like most other nutrition indices, the statistical approach is adopted to construct the Malnutrition Index, Household Condition Index, and Women Condition Index. These indices are constructed based on methodology used in Human

Development Index (HDI) developed by United Nations Development Programme (UNDP). Firstly, the maximum and minimum values are assigned to each indicators, and all the variables are equally weighted. (Rosenbloom et al., 2008) Moreover, all the variables included in this research exercise are basic needs for human development. Hence, equal weightage is given to them for making them comparable in a meaningful way. Some of the variables are positive indicators and some of the variables are negative indicators of child health. Therefore, standard process is adopted according to the following formula.

1) For positive indicator =  $(X_i - \text{Min}_i) / (\text{Max}_i - \text{Min}_i)$

2) For negative indicator =  $(\text{Max}_i - X_i) / (\text{Max}_i - \text{Min}_i)$

where,  $X_i$  = actual value of the indicator

Stunted, wasted, severely wasted, underweight, overweight, and women aged 20 -24 years married before age 18 years are negative indicators of the individual social situation of a children's health. While electricity, drinking water, sanitation facility, clean fuel, women's education, antenatal check-up, and institutional birth are positive indicators of the socio-economic situation of a children's health. The maximum and minimum values of each indicator for NFHS – 4 and NFHS – 5 are given in the below [Table No: 1](#). While actual values of these indicators are given in Table 2.

[Table No: 2](#) shows the actual value of each indicator of three Indian States- Gujrat, Sikkim, and Bihar. All these data are taken from NFHS-4 and NFHS-5. The Fourth and Fifth series are comparable over a period of time. For the construction of all Three indices (Malnutrition Index, Household Condition Index, Women Condition Index) firstly, normalized value of each indicator is counted. Then after, the weighted mean of each indicator is calculated. The methodology and construction of these indices are incorporated in the [Appendix-1](#).

[Table No: 3](#) shows the normalized values of each indicator obtained during NFHS-4 and NFHS-5 in Gujarat, Sikkim and Bihar. The value lies between 0 to 1. Getting closer to 1 or equal to 1 indicates better conditions while getting closer to 0 or equal to 0 indicate worse situation. It refers that State should take some initiatives for improvement. Now, the values of Malnutrition Index, Household Condition Index and Women Condition Index are shown in table- 4 by taking weighted mean of the values of different indicators of these three indices.

[Table No: 4](#) shows the analysed value of Malnutrition Index, Household Condition Index and Women Condition Index.

## MAJOR OUTCOMES

In terms of Malnutrition, the condition of Gujarat is seen worst in NFHS -5. According to NFHS-4, Gujarat had a Malnutrition Index value of 0.35, which decreased to 0.24 in NFHS-5. It indicates that the rate of Malnutrition in Gujarat is rising (NFHS-5). Apart from this, although the value of Household Condition Index has remained stable in NFHS-4 and NFHS-5 for Gujarat, the rate of

Malnutrition has increased in NFHS-5. Moreover, the women condition is deteriorated from NFHS-4 to NFHS-5 for Gujarat. Which shows that the economic situation of the state does not play an important role in affecting the rate of malnutrition. (Rosenbloom et al., 2008). We can say that poverty and Malnutrition are linked but are not identical (Haddad & Alderman, 2000). Sikkim is having the highest per capita Net State Domestic Product (NSDP) in 2015-16 & 2019-20. In Sikkim, the Household condition and Women condition are worsened although its Nutritional status has increased. This indicate that this situation is different from Gujarat. It may be because of we have not consider all the factors that affect to Malnutrition. Same situation we can see in Bihar also. That means factors affecting the prevalence of Malnutrition vary by region, zone, and community (Yimer, 2000). The results show that despite having the lowest per capita NSDP, Bihar's nutritional status is far better than Gujarat's nutritional status. Gujarat's nutritional status is worsened in NFHS -5 as compared to NFHS-4 despite a stable Household Condition Index. This may be because of deprivation in Women Condition Index. While, a different

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situation in Sikkim's case is observed because despite decreasing the Household Condition and Women Condition Index, it has improved its nutritional status in NFHS-5 compared to NFHS-4.

## CONCLUSION

Malnutrition varies by region, zone, and community. Both socio-economic and individual factors influence Malnutrition. Only if the economic situation improves but there is no change in the social thinking and lifestyle of the people, then the improvement in the economic situation does not result in reduction of Malnutrition. Along with this, improvement in economic conditions is a prerequisite for improvement in social conditions. The index illustrates that good nutrition and development are not necessarily synonymous. Thus, if measures are taken keeping in mind both the socio-economic situation, success can be achieved in reducing the Malnutrition rate.

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Table No: 1 Maximum and Minimum Value of parameters.

Sr. no.	Indicator	NFHS – 4		NFHS – 5	
		Maximum	Minimum	Maximum	Minimum
1	Children under 5 years who are stunted	48.3	19.7	46.5	22.3
2	Children under 5 years who are wasted	29	6.1	25.6	9.8
3	Children under 5 years who are severely wasted	11.4	2.2	10.9	3.4
4	Children under 5 years who are underweight	47.8	12	41	12.7
5	Children under 5 years who are overweight	8.6	0.7	10	2
6	Population living in household with electricity	99.8	60	100	59.4
7	Population living in household with an improved drinking water source	99.6	63.9	99.2	77.1
8	Population living in household that use sanitation facility	98.2	25	98.7	49.4
9	Household using clean fuel for cooking	84.1	17.8	96.5	31.9
10	Women with 10 year or more year of schooling	59.4	22.8	96.5	23.2
11	Women age 20 – 24 years married before age of 18 years	42.5	7.6	41.6	5.4
12	Mothers who had at least 4 antenatal care visits	90.1	14.4	93	20.7
13	Institutional birth	99.8	32.8	99.8	45.7

Source : (Ministry of Health & Family Welfare, 2021) (Ministry of Health and Family Welfare, 2020)

**Table No: 2 Actual value of each parameters for Gujarat, Sikkim and Bihar**

Sr. No.	Indicator	Gujarat		Sikkim		Bihar	
		NFHS-4	NFHS-5	NFHS-4	NFHS-5	NFHS-4	NFHS-5
1	Children under 5 years who are stunted	38.5	39	29.6	22.3	48.3	42.9
2	Children under 5 years who are wasted	26.4	25.1	14.2	13.7	20.8	22.9
3	Children under 5 years who are severely wasted	9.5	10.6	5.9	6.6	7	8.8
4	Children under 5 years who are underweight	39.3	39.7	14.2	13.1	43.9	41
5	Children under 5 years who are overweight	1.9	3.9	8.6	9.6	1.2	2.4
6	Population living in households with electricity	96.2	97.6	99.4	99.3	60	96.3
7	Population living in households with an improved drinking water source	95.9	97.2	97.8	92.8	98.4	99.2
8	Population living in households that use sanitation facility	63.6	74	89.7	87.3	26.5	49.4
9	Households using clean fuel for cooking	52.6	66.9	59.1	78.4	17.8	37.8
10	Women with 10 years or more years of schooling	33	33.8	40.7	49	22.8	28.8
11	Women age 20 – 24 years married before age of 18 years	24.9	21.8	15	10.8	42.5	40.8
12	Mothers who had at least 4 antenatal care visits	70.5	76.9	74.7	58.4	14.4	25.2
13	Institutional birth	88.5	94.3	94.7	94.7	63.8	76.2

Source: - (Ministry of Health & Family Welfare, 2021)(Ministry of Health and Family Welfare, 2020)

**Table No: 3 Normalized values of each indicator for Gujarat, Sikkim, and Bihar**

Sr. no.	Indicator	Gujarat		Sikkim		Bihar	
		NFHS-4	NFHS-5	NFHS-4	NFHS-5	NFHS-4	NFHS-5
1	Stunted	0.34	0.31	0.65	1	0	0.15
2	Wasted	0.11	0.03	0.65	0.75	0.36	0.17
3	Severely wasted	0.21	0.04	0.60	0.57	0.48	0.28
4	Underweight	0.24	0.04	0.94	0.98	0.11	0
5	Overweight	0.85	0.76	0	0.05	0.94	0.95
6	Electricity	0.91	0.94	0.99	0.98	0	0.91
7	Improved drinking water source	0.89	0.90	0.95	0.71	0.97	1
8	Sanitation facility	0.53	0.49	0.88	0.77	0.02	0
9	Clean fuel	0.52	0.54	0.62	0.72	0	0.09
10	Women with 10 years or more years of schooling	0.52	0.14	0.49	0.35	0	0.07
11	Women age 20 – 24 years married before age of 18 years	0.50	0.55	0.79	0.85	0	0.02
12	Mothers who had at least 4 antenatal care visits	0.74	0.78	0.80	0.52	0	0.06
13	Institutional birth	0.83	0.89	0.92	0.9	0.46	0.56

Source: Authors' own calculation

Table No: 4 Value of Malnutrition, Household Condition and Women Condition Index for Gujarat, Sikkim, and Bihar

Sr. No	Indices	Gujarat		Sikkim		Bihar	
		NFHS-4	NFHS-5	NFHS-4	NFHS-5	NFHS-4	NFHS-5
1	Malnutrition Index	0.35	0.24	0.57	0.67	0.38	0.31
2	Household Condition Index	0.71	0.71	0.86	0.79	0.25	0.50
3	Women Condition Index	0.65	0.59	0.75	0.65	0.11	0.17

Source: Authors' own calculation

### Appendix -1

The various indices are prepared as per the following procedure.

Step – 1

For positive indicator =  $(X_i - Min_i) / (Max_i - Min_i)$

For negative indicator =  $(Max_i - X_i) / (Max_i - Min_i)$

#### 1) Malnutrition Index

For the construction of the Malnutrition index, the Stunting Index, Wasted Index, Severely Wasted Index, Underweight Index, and Overweight Index are constructed using the following formula.

$$(Max_i - X_i) / (Max_i - Min_i) \dots\dots\dots (1)$$

where,

$X_i$  = Actual value of (i) variable

$Max_i$  = Maximum value of (i) variable

$Min_i$  = Minimum value of (i) variable

## 2) Household Condition Index:

Electricity, drinking water, sanitation facility and clean fuel are considered in the construction of Household Condition Index. To calculate the Household Condition Index, electricity index, drinking water index, sanitation facility index and clean fuel index have been calculated using the following formula.

$$(X_i - \text{Min}_i) / (\text{Max}_i - \text{Min}_i) \dots\dots\dots (2)$$

where,

$X_i$  = Actual value of (i) variable

$\text{Max}_i$  = Maximum value of (i) variable

$\text{Min}_i$  = Minimum value of (i) variable

## 3) Women Condition Index:

Women Condition Index Consists of four parameters: (1) Women with ten or more years of schooling (2) Women age 20 – 24 years married before 18 years of age (3) Mothers who had at least 4 antenatal care visits (4) Institutional birth. For the construction of the Women Condition Index, equation-2 is used for 1, 3 and 4 parameters while equation-1 is used for the second parameter. The values of each indices obtained using formula no. 1 and formula no. 2 and are given in table no. 3.

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**Article**



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## **A narrative review on improving clinical reach to rural patients via tele health for accessing health care services**

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### **ABSTRACT**

With the use of Telehealth, the speciality services can be conceivably doable for rural healthcare facilities rather than staffing with specialty and subspecialty providers. Telehealth allows specialists and subspecialists to visit rural cases nearly, perfecting access as well as providing a wider range of healthcare services available to rural communities via telemedicine for various specialities. Remote patient monitoring (RPM) is a method can be aid us in reaching these communities. RPM is the collection of health and medical data from cases in their home. The data will be transmitted to a healthcare provider in a different position to aid in healthcare decision- making. Mobile health can be used by providers and public health units to communicate with cases and citizens in their homes. Tele pharmacy extends access by delivering medications at rural healthcare facilities and community pharmacies. The medicines which are not available to the patient at rural region, can be provided with the help of courier services. The clinician can advise supplementary foods or dietary modifications which will help the patient to gain the Nutrition which are not available in over-the-counter medicines. Factors hindering the growth of telemedicine have dependence on malpractice issues, advances in technology, availability of device, bandwidth issues, cost effectiveness, offense to legislation, physical check-up, data misplace. By accessing health services via Tele health, they can get health support without any loss of pay and several factors.

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## INTRODUCTION

The concept of telemedicine came in 1970 after some time it is being called telehealth. Technically, telemedicine is a subset of telehealth. The need for telehealth is a platform to provide healthcare to a patient. Has high-speed wireless technology become cost-effective to establish and demonstrate module success become more prevalent. Telehealth can bring easily accessible quality healthcare via calls and video calls and even by proving reminders for medicine intake and for appointment-related information through messages. Telehealth covers all health services provided using telecommunications technology & telemedicine refers specifically to clinical services under that umbrella. Telehealth is used for delivering healthcare to patients at a distance, which shall include the assessment, diagnosis, consultation, treatment, education, care management, or self-management of a patient. Telemedicine and Telehealth made their major presence during the pandemic or disaster period. In India telemedicine was initiated by the India Space Research Organization (ISRO). In 2005 Indian Health Ministry established a National Telemedicine Taskforce legal with Ministry of Health and Family welfare. Telemedicine and Telehealth have come into the practice on a large scale only during the pandemic of COVID-19 for the patients in home isolation, etc... And are regulated by the Indian medical association, Medical Council of India (MCI) which includes privacy, data protection, medical records of the patients.

## ACCESSING TELEHEALTH AND TELEMEDICINE IN RURAL AREAS IN INDIA

To create awareness about telehealth and its uses in rural committees, we demonstrate how the accountability of the public to a telehealth facility in the region. One approach is through telehealth can deliver health care through technology such as smartphones, tablets, laptops, and webcams. There should be a proper network, internet & Wi-Fi access. If people want to connect with a doctor, they need to take an appointment & that time they can easily access the Consultant. After the doctor consultation, it will be provided a prescription & Medicine or drugs could be delivered through Telemedicine. Follow through on prescription orders or referrals to other providers. Ask for feedback on the telehealth appointment and ask what they liked or can be improved.

Consultations in remote areas are quicker, less expensive, and more convenient than visiting hospitals with the help of telehealth. Through telehealth, all specialists can discuss various options with the patient together leading to transparency at its highest. One of the primary benefits of telehealth in rural areas is that it can help rural populations overcome significant barriers to care, such as Geographic distance from specialists & treatment centres, Minimal public transportation, and Healthcare Provider shortages. Patients' health can be improved through monitoring, timeliness, and communications with healthcare providers. Telemedicine can avoid the hassles of travel and reduce the waiting time outside the hospital.

## **METHODS FOR DELIVERING TELEHEALTH AND TELEMEDICINE**

By using technology in healthcare to bridge between hospital settings into telehealth and telemedicine system. In rural and remote areas to avoid the loss of pay and to deliver healthcare easily, telehealth and telemedicine makes an important role. During the time of the covid-19 pandemic, people were using telehealth consultation and telemedicine was used for treatments and isolation. With the use of technology like Remote patient monitoring (RPM), Mobile health, and Tele pharmacy doctors and health care providers can connect to the people and will provide the required pharmaceutical products.

### **Remote Patient Monitoring (RPM)**

Remote Patient Monitoring is an effective healthcare delivery model to gather patients' data without visiting directly to the hospitals. It increases comfort to the patients and engages with the doctors and healthcare providers. Since it is a specific technology, it helps to improve the overall Telehealth industry.

### **Mobile Health**

Mobile health is a delivery with the use of mobile phones and other wireless devices to attain medical care. It helps in Treatment support, chronic diseases, and disease surveillance. It integrated the health record of patients to provide better health support.

### **Tele Pharmacy**

Tele Pharmacy is a service delivery, which delivers pharmaceutical products by telehealth and communication. Patients can avail of their prescribed drugs via tele pharmacy.

## **LIMITATIONS IN PROVIDING TELEHEALTH TO THE RURAL PEOPLE**

Telehealth visits developing in India are not a complete substitute for in-person visits, nor they are feasible for all patients or clinical situations. A significant limitation is an inability to conduct an in-person physical examination. Inaccurate dosing of weight-based drugs (e.g., chemotherapy treatments, and pediatric medications) may occur due to the inability to weigh patients.

Many traditional office elements, such as physical presence, and emotional connections are restricted by digital technologies and should be overcome over years. Some patients may have no prior experience with video visits and prefer in-person visits over video visits, so proper training should be given to patients and doctors too. Similar preferences for in-person interactions have been noted in specialty care services.

The clinician must use tele Health and Tele medicine services appropriately for care to be delivered effectively and accurately. The "digital divide" can create potential disparities in access to participation in telemedicine, including for those living in rural areas with limited Internet access, older adults, and those with diverse cultural settings and socioeconomics.

## **CONCLUSION**

Telehealth offers a promising opportunity to improve health outcomes for people by increasing access to healthcare. Greater community awareness is an important driver for telehealth services and public awareness efforts should focus on increasing community understanding of the options for access to health services including telehealth models of care.

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## Paradigm Shift Caused by COVID Pandemic

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### ABSTRACT

The coronavirus pandemic was widely thought to be the biggest worldwide health crisis of the 20th century. The most difficult medical emergency that humanity has faced have occurred since the start of World War II. By December 2019 end, the newer respiratory illness (SARS-CoV-2) first arrived in city of China (Wuhan). More than 200 territories and countries have more than 51.949 million confirmed COVID-19 patients, according to WHO. Unique problems in the areas of personal and social life have been presented by the COVID-19. The COVID-19 virus has produced the worst disturbance in education policies in recorded history, affecting around 1.6 billion pupils in more than 200 countries. Around the world, closures of schools, institutions, and other learning environments have impacted over 94% of pupils. After the COVID-19 breakout, scientists have expressed their works on numerous teaching / learning strategies. Many institutions, colleges, and universities are no longer providing face to face education. The SARS-CoV-2 pandemic, which have affected at least 215 countries, regions, and territories, has affected the Chinese economy and spread rapidly to the rest of the world. Customers are the sources of market expansion, competition, and financial integration in every market. Economic instability is causing changes in consumer behaviour, though it is unknown how much of the change that occurred during the crisis will endure.

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Consumer Behaviour, Covid Pandemic, Education, Financial consequences, Global Economy, Trade and development

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## COVID PANDEMIC

Almost all world has been impacted by the COVID-19 pandemic epidemic. In December 2019, the outbreak was first identified in Wuhan. Nations from all over the world issued cautionary statements to the general population. Hand

washing, wearing face masks, maintaining physical distance, and avoiding large groups and gatherings have all been precautions for public health. To put a halt to Lockdown and residence staying methods have been employed to limit the

disease's transmission and slow the curve (Pokhrel & Chhetri, 2021; Sintema, 2020).

As of May 11th, 2020, the viral disease had effectively spread to 215 nations, regions, or territories since its inception. A particular vaccination for the new virus was still being researched, but many factors must be taken into account, such as the target population of vaccine administration, the virus rate of mutation, etc. On knowledge from the last two epidemics brought on by viruses belonging to a similar family, non-specific medicines are currently used. (Asad Ullah et al., 2020; Islam et al., 2020). The overwhelming number of infected cases has overburdened the healthcare systems in the impacted nations. Severe containment measures implemented globally in an effort to stop further virus transmission have contributed significantly to the slowing of the economy in a number of ways, starting with the negative effects of as a result of the concurrent supply and demand shock, mortality and morbidity restricted travel and closed borders (McKibbin & Fernando, 2021). The current economic decline may even be more severe than the 2008–2009 economic crisis, in which the rate of global commerce decreased more quickly than the rate of world growth (Baldwin et al., 2020a). It is anticipated that a period of stagnation will come after the decline in employment and economic activity, eventually leading to a recession (Sułkowski, 2020). The disease first appeared in China before spreading to other economically prominent countries. A global economic shock was sparked by those countries' economic importance and the outbreak in those countries. These six countries are dealing with major effects of the outbreak that account

for, respectively, 60%, 65%, and 41% of global supply and demand, manufacturing, and manufacturing export. These nations are also at the epicentre of numerous supply networks, which causes a domino effect of supply shock in other countries connected to their network (Baldwin et al., 2020a)

In terms of biology, the COVID-19 pandemic may resemble the SARS outbreak in 2003, although the two situations have different economic ramifications. For instance, China now makes up 16% of the global economy, compared to just 3% in 2003. It also leads the globe in terms of import and export, which has an indirect impact on all related businesses, such as Apple and Nike. In addition to the supply and demand crises it created, the COVID-19 pandemic caused significant slowdowns in employment and productivity growth, which shocked the labour market. Businesses all across the world are experiencing a terrifying decline in revenue, which is therefore causing insolvencies and job losses. According to a report by the International Labor Organization, as of April 29, 68% of all workers worldwide, including those in Africa, Europe, the Americas, and Central Asia with proposed workplace closures, are in turmoil, with 81% of those workers being employers and 66% being own-account workers (ILO). According to previous crises, the shock is expected to result in a reduction in working hours and wages, which will lead to an increase in informal employment. Unfortunately, this strategy may also be hindered by aggressive containment measures, which affect 1.6 billion workers in the informal economy. The most susceptible groups of

workers include those who work in the aviation, tourist, and hospitality sectors as well as informal and/or migrant workers. According to the ILO, measures must be implemented to assure worker, employer, and family health protection in order to address this rising problem. Suitable remedies for the small company and informal economy sectors should include financial aid and loan guarantees in addition to income support policies to boost the economy and labour demand (Zaman et al., 2020a).

## THE IMPACT OF THE COVID-19 ON THE PUBLIC HEALTH CARE SYSTEM

This pandemic has resulted in both short- and long-term health issues, such as mental stress, elevated anxiety, and post-traumatic stress disorder (COVID-19) (PTSD). Even before the COVID-19 epidemic, Pakistan's already-fragile healthcare system was overburdened. A doctor sees 963 individuals, and there is room in a hospital for 1608 patients who need inpatient care, according to the UNDP's data. The IMF gave Pakistan a bailout during this crisis totalling \$6 billion USD to end the financial crisis and boost the Pakistani economy. The public health system is being supported by the Pakistani government in the fight against the coronavirus pandemic. When the coronavirus outbreak severely affected all sectors of the economy in Pakistan, the country's economy was just beginning to stabilise and recover from the financial crisis (Maqsood et al., 2021).

## PARADIGM FACTORS

### Education

Bhutan initially announced the closing of schools and other institutions and a reduction in business hours in the of March 2020 second week. The whole nation was placed under lockdown on August 1, 2020. People were allowed to move around freely, offices reopened, and some levels of schools and universities resumed operations while others carried on with online lessons at this time. Above 170,000 kids in grades PP through XII will be impacted by today's school closure in Bhutan. The repercussions are wide-ranging and will probably only get worse for learning in the days to come. Many schools, universities, and other higher education institutions no longer offer in-person education training. It is vital to implement novel and creative teaching and evaluation strategies. We now have the opportunity to prepare for the arrival of digital learning thanks to the COVID-19 outbreak. Research has identified a number of issues, including knowledge barriers, poor learning environments at home, equity issues, and academic success in higher learning. Other drawbacks include the inadequate online teaching infrastructure, the insufficient exposure of teachers to online instruction, and the absence of prior online teaching experience (Pokhrel & Chhetri, 2021).

### Market

#### *Significance of Market*

In economics, a market is a common physical or virtual platform where willing consumers and sellers trade products and services. Retailers or companies that sell to other markets are examples

of market participants. Based on a variety of variables, including the size and kind of the product, the client base, legality, etc., there are several sorts of marketplaces. The impact of COVID-19 on the world market has been significant, shattering predictions for an 11-year bull market in 2020. According to a report by the International Monetary Fund, investors have pulled out a total of US\$83 billion from a number of emerging market companies, which has ultimately reduced their revenue. In the worst-case scenario, numerous investors seek liquidity (Relations, 2008).

### **Types of markets include:**

#### ***Financial market***

is used to describe a place where buyers and sellers can trade securities, bonds, and currencies. Stock markets, foreign exchange markets, bond markets, etc. are a few examples. It is one of the industries that has been most severely impacted by changes in the price of oil on the worldwide market. Due to this, the value of financial assets has decreased, which has affected currency exchange rates as well. There have been disruptions to stock markets worldwide, including those in New York, Frankfurt, Tokyo, and London. For a number of businesses, the supply chain collapse has resulted in cash flow issues.

#### ***Auction market***

refers to a website that brings together potential customers for the purchase of a specific batch of goods. The item is offered for sale to the highest bidder. In these markets, goods like animals, houses, etc. are typically exchanged.

#### ***Black market***

Describes black markets that are not monitored by the government or other regulatory organisations. Some are done to circumvent tax restrictions, while others might offer goods and services when those are in low supply. Some underworld industries, like the one in Cuba, have benefited from the current health crisis by meeting the rising demand for medical goods. Along with medical supplies, consumer products and food are also stolen inside Cuba and sold again at exorbitant costs.

Markets are in charge of distributing commodities among people. By facilitating trade, they trigger a chain reaction of favourable economic developments, beginning with increased production and employment that raises the nation's GDP. Given the current circumstances, many business owners are forced to work from home as not all companies offer this option and many people are being let go from their positions. As a result, the declining employment rate is a global phenomena. If the lockdown and closed borders continue, there may be a cascading effect that causes firms to be unwilling to hire people, which would result in very little demand for their goods. However, because the labour market will be competitive and we can anticipate potential inflation, workers will be willing to accept a lower wage rate. The poor workers may have no choice but to take any job they can find, even if it pays less, as the cost of living is on the rise.

### Factors Affecting Economies

Demand, supply, prices, wages, output, cost, and labour are a few of the elements that are typically closely linked to economic growth. In the wake of this pandemic, they are all impacted. Due to the pandemic's disruption of supply networks and worldwide trade, the global economy could contract by as much as 1% . Increased mortality and morbidity rates have decreased productivity and production capacity, which eventually caused a supply shock. Meanwhile, changing consumption patterns and investments as a result of the current situation's looming uncertainty and limited income and wealth have caused a supply shock. This is not all, as a significant portion of economic shocks are dispersed from one country to another through mechanisms associated with globalisation, such as links in finance, trade, and migration. The use of drastic measures to contain the virus has been both a blessing and a curse. Individual businesses and organisations that depend on gathering and physical presence have been forced by social distance to cut back on their production or, in the worst case scenario, to cease operations . The severity of the economic repercussions will mostly be determined by two variables.

- The duration of the repression of the main economies' economic activity.
- The effectiveness of the budgetary policies implemented by the governments in response to the Changes in Labour Supply

A balanced pattern of wages, income, and employment is ensured by labour economics,

which deals with both employers and employees. When the labour supply changes, the pattern is disturbed. According to various sources, COVID-19 now takes 14 days to incubate. As a result, if a worker is infected with COVID-19 or exhibits several signs of the disease, he or she must miss 14 days of work. Reduced productivity is a major consequence of being absent from work. It has a big effect on households as well as businesses because more health services and products are being consumed. As a result, household health spending has significantly grown. Both the individual and his or her family are mentally impacted. So, the opportunity of working online is eliminated due to illness, stress, and total isolation. Additionally, it may have a long-lasting financial impact on both the person and the business. The specific business or organisation may experience difficulties as a result of the absence of employees, and as a result, they may adopt various action plans, such as a new furlough policy or a reduction in employee compensation.

### Crisis in Manufacturing Companies

As a result of COVID-19, manufacturing businesses are currently experiencing a crisis. Plans for production are delayed, and this undoubtedly has ripple consequences. European automakers are halting manufacturing, including Ferrari and Volkswagen. Due to a closure of the industry and a shortage of parts, they are ceasing operations. Additionally, the effect can be seen in high-end products like Swiss timepieces. The scarcity of parts and components is causing issues for the makers. The disruption of the supply chain will undoubtedly have a significant impact on the

costs of doing business for industrial enterprises in the near future. Hasbro, a toy manufacturer, is likewise struggling because 70% of its supplies come from China. Hasbro has had a very tough time marketing its products as a result of the closure of numerous factories in China and the disruption of the delivery route.

### **Revenue Decline in Media Industry**

The COVID-19 outbreak has also had a significant impact on the media sector. The amount of advertising revenue being received by various media organisations and television networks has significantly decreased. For instance, it's possible that Facebook's ad revenue would decline by \$15.7 billion in 2020. The current estimate for Google's net income is \$127.5 billion, a decrease of \$28.6 billion. According to estimates, the COVID-19 phenomena might cause Google and Facebook to lose over US\$44 billion in advertising income by 2020.

Due to the outbreak, several multimedia companies are experiencing financial difficulties and record-low TV ratings because the venues are vacant and people cannot physically attend events to enjoy them. Due to the coronavirus outbreak, numerous employees of WWE, an American media and entertainment corporation, have been let go. The company's flagship programme recently had its lowest viewership ever. Only 1.68 million people watched the programme, which is the fewest since 2018. Several sporting events, including the Tokyo Olympics and UEFA Euro 2020, that were scheduled to be aired by the media have been moved to 2021. Various TV

programmes' production is either halted or delayed. Due to the lockout, award shows and concerts are also cancelled. Due to the COVID-19 epidemic, Japan's animation industry is likewise experiencing a crisis with an uncertain future.

### **Impacts on Tourism Industries**

Due to the desertification of popular tourist locations like Paris, Venice, Madrid, and Rome, the tourism sector is suffering tremendous losses. Lockdowns and travel restrictions have already dealt this business serious blows. To maintain their operations, German tourist behemoths like Touristik Union International (TUI) have applied for public assistance. Disneyland and other popular tourist destinations have been declared permanently closed. Even Southeast Asian nations like Malaysia are experiencing severe losses in the travel and tourist sector. In 2020, the nation anticipated receiving over 30 million visitors and generating €20 billion in income. However, because the COVID-19 pandemic is seriously affecting about 3.5 million individuals who work in the tourism industry, the predicted revenue may decline significantly. Additionally, spillover impacts can be seen because companies that depend on tourists are also about to suffer a significant financial loss.

### **Global GDP Decline**

The pandemic has dealt the world economy a serious blow, but its long-term effects are still unknown. To calculate the overall economic contraction, economists are considering all factors. GDP has consistently been a significant role in macroeconomics. While it is impossible to

say with certainty how much the GDP will contract in the coming year, financial analysts have estimated that the US would see a 2.4% GDP loss in the event of a global pandemic. The worst-case scenario is estimated to result in a monetary GDP loss of US\$76.69 billion. Additionally, the real world GDP could fall by 0.5% (from 2.9% to 2.4%). While the GDP loss in Italy has been predicted to be 3%, the projected GDP loss in China is 2.4%.

### **Disruption of Global Supply Chain and Global Trade**

The production interruption has caused a disruption in the global supply chain. As a result, the state of worldwide trade is in danger, and negative spillover effects have hurt suppliers at all levels of the supply chain. It has been predicted that global trade may decline in 2020, having an impact on every sector of the economy. It won't just have an impact on the powerful exporters; it will also hurt the importers. The COVID-19 phenomena may cause a 32% decrease in global trade, according to the World Trade Organization (WTO). As international tourist, travel, and hospitality businesses cease operations, the "domino effect" will start to take effect, affecting SMEs all over the world. Additionally, stock indices have plummeted and financial markets have crashed. The Dow Jones Index has already experienced its greatest drop in a single day. Markets all over the world are sharply declining.

### **Unemployment, Poverty and Other Issues**

The unemployment rate has dramatically increased as a result of COVID-19. The self-

employed and those with lower incomes are particularly impacted by the domino effect. In addition, a number of small enterprises are closing as a result of the pandemic. As a result, there is a possibility that unemployment will spread throughout the world. In the United States, more than 10 million people have already lost their work. 6.7% of all working hours in the globe are thought to be at risk of disappearing, or 195 million full-time jobs. According to the International National Organization, countries with upper-middle incomes are more likely to suffer the greatest loss. Due to both full-time and partial workplace closures, the COVID-19 pandemic has had a significant negative impact on about 81% of the world's workforce. In America, 43% of workers are at risk of losing their jobs, compared to 26% in Africa. Around 2 billion people worldwide who operate in unregulated industries (mostly in emerging economies) are at danger. Additionally, it has been predicted that for the first time since 1998, worldwide poverty may increase. According to current projections, the COVID-19 phenomena will push 49 million people into extreme poverty worldwide by 2020. The region with the greatest potential for impact is Sub-Saharan Africa, where an estimated 23 million people may be forced into poverty. The figures are also rather high for India, where it has been estimated that 12 million people may live in poverty by the end of 2020. Due to the epidemic, numerous international trade shows have been postponed. For instance, the Austrian "Auto Emotion - Automobile Exhibition" has been cancelled. The "Antiquities and Contemporary Art Exhibition" has been postponed in France. International Fair "Venus

Berlin" has been postponed. Numerous more shows and fairs suffered the same fate. As a result, the harm has already been done.

### **Oil Prices Down Worldwide**

The oil markets have suffered considerable losses as a result of the collapse in the global demand and supply chains. Since there is now significantly less demand for oil and oil-derived products, imbalances are getting worse as more supply is introduced into the market. Oil lost 70% of its value when it fell under \$20 per barrel. As the supply during the COVID-19 epidemic is far more than the demand, the storage capacity is also approaching its limitations. The demand shock, though, might allow lower-cost producers to reclaim some market share. The largest oil production cuts in history were informally agreed to on March 9 by Russia, the Organization of Petroleum Exporting Countries i.e., OPEC, and other producers. Along with Equatorial Guinea, Algeria, Angola, Libya, Gabon, Nigeria, Kuwait, Saudi Arabia, Republic of the Congo, United Arab Emirates and South America, OPEC also includes Middle East, Iraq and Iran. For the months of May and June, they decided to remove 10% of the global production from the market. Rebalancing the status of the oil markets, experts have warned, may prove to be considerably more challenging than previously thought (Zaman et al., 2020b).

### **Trade**

#### ***Manufacturing and Trade***

This pandemic is unique since previous post-war crises and pandemics typically afflicted poorer countries. Locally, poorer countries have

significant effects, but because to their economy' isolation from the rest of the world, the global effects are rarely recognised. In contrast, the COVID-19 epidemic has afflicted wealthier, more developed countries that are significantly more economically significant to global trade. Due to their reliance on trade with larger countries like China, the USA, and the UK, smaller countries will be severely impacted by this, creating a supply-side shock similar to the Great Trade Collapse of 2008–2009. The highest rates of illnesses are seen in the nations that contribute the most to the global GDP and export the most produced goods. Consequently, this is a shock on both the sides of demand and supply (Zaman et al., 2020b).

The COVID-19 epidemic is, however, having a significant impact on the services industry, unlike earlier shocks. In fact, as we will later demonstrate, while global commerce in goods returned to a normal level by the end of 2020, it has not yet happened with regard to trade in services. One of this pandemic's most defining features is that it has forced us to implement social segregation measures and movement restrictions for the protection of public health. This has a significant impact, particularly on the trade in services because, in contrast to the trade in products, some services commerce involves cross-border mobility and physical proximity between providers and customers. For instance, cross-border consumer and supplier mobility is necessary for services trade, which the WTO General Agreement on Trade in Services (GATS) categorises under modes 2 and 4, respectively. Therefore, restrictions on cross-border movement

will have a more significant effect on the trade in services. Furthermore, depending on whether a physical connection between suppliers and consumers is required and whether an online supply is accessible, this influence may differ among service industries and subsectors (Ando & Hayakawa, 2022).

For instance, cross-border consumer and supplier mobility is necessary for services trade, which the WTO General Agreement on Trade in Services (GATS) categorises under modes 2 and 4, respectively. Therefore, restrictions on cross-border movement will have a more significant effect on the trade in services. Furthermore, depending on whether a physical connection between suppliers and consumers is required and whether an online supply is accessible, this influence may differ among service industries and subsectors. By offering reliable benchmark estimates of the direct impact of the epidemic and the policies to stop its spread on trade flows, our data can be helpful in that endeavour. These estimates might be converted into elasticities for those models' calibration. Our findings also demonstrate how the pandemic situation in other nations affects bilateral trade flows, indicating that the third-country channel should be considered in any structural model. In reality, these effects from other countries show that national coordination is essential for the best pandemic response strategies. Although this makes sense, policymakers need accurate assessments of the scope and character of these interdependencies. Using data on China's exports to every nation and region in the world, we give such estimations of the country product level for

trade flows. This enables us to separate the pandemic's effects on importing nations. Since COVID-19 is both a demand and a supply shock, its impact on a nation's import demand is inherently equivocal. Here, we display the net results as determined by the imports of China into the nation. Additionally, we distinguish between the direct economic impacts of the pandemic as measured by COVID-19 mortality and the indirect effects brought on by governmental decisions to halt economic activity. We discover that the adverse demand effects are dominant in both dimensions and are not insignificant. For instance, based on our baseline specification's point estimates, a monthly increase in COVID-related mortality per capita and the degree of lockdown stringency equal to one standard deviation would result in a decrease in imports from China of about 6%. (1.5 per cent stemming from the former, 4.2 per cent due to the latter). If we assume a change in each of those variables from zero to the sample mean, the joint effect would imply a decrease in imports from China of 11.3%, while a change in each of those variables from zero to the highest levels in the sample would imply a joint effect of just over 30%. But this is only a partial picture because one must also take into account how the pandemic's effects on a country's other trading partners affect its imports from China. For instance, a nation may choose to import more of a commodity from China in response to domestic pandemic conditions if its primary trading partners are unable to do so due to COVID-related limitations in that nation. However, the influence of the pandemic's direct and indirect consequences in the trading partners

is a priori unclear, much like in the domestic economy (Liu et al., 2022).

## Economy

### *World Economy Before and After COVID-19*

Pandemic At the beginning of 2020, a number of predictions indicated that an economic rebound was imminent. The effects of the world financial crisis in 2008 were minimal. Additionally, trade and economic growth increased in the majority of the nations. Additionally, the stock markets had reached fresh all-time highs . An enormous economic crisis has been brought on by the COVID-19 outbreak over the past four months. Three crucial sectors need to be examined in order to accurately gauge the effect on the global economy. Manufacturing and trade are first, followed by services, then financial markets, and finally services and commodity prices (Baldwin et al., 2020b; Zaman et al., 2020b).

Manufacturing and the service industries were both impacted by the COVID-19 epidemic. Economic stress has already begun and will intensify quickly. Lockdowns and productivity is decreased by social isolation on the one side, but they also sharply reduce consumer demand for products and services, which causes the market to experience a collapse in activity. However, the only practical methods for halting the development of COVID-19 are lockdown and social seclusion. The economic hazards of limiting the economy still exist, Even so, governments learn by doing, as was the case in the past with the success of the containment approach in the Bhilwara district of Rajasthan, India. Similar to this, flattening the caseload

curve has a cost but is essential for the overall economy (Chaudhary et al., 2020).

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## Post covid-19 paradigm shift in public health

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### ABSTRACT

The health and economic impact of multidrug-resistant (MDR) microorganism has endlessly adult over the past years, reaching associate degree calculable peak of roughly of roughly deaths annually. Neglected hygiene, poor compliance with infection management procedures, inappropriate antimicrobial use, and short handiness of medicine and new effective antibiotics has contributed to the current inglorious world record. Despite these terrible figures, infection interference and treatment haven't been thought of high priorities on the agendas of most industrialized countries. In the twentieth Century there are shifts within the paradigms that have ruled drugs and human health within the fashionable western world. There has been a shift from the main focus on specific biological analysis and pathological medicine to advanced human interactions with the atmosphere and with sociopolitical and economic processes. There square measure advanced models of systems in medicine, in neurobiology, and in biological science, yet as advanced ways in which of understanding interactions as in epidemic modeling, in social media technologies, socioeconomic factors, and AI. The oldest paradigm centered on specific malady mechanisms and treatment. This gave thanks to paradigms that traditionally were broader and a lot of inclusive like "international health". The international health paradigm centered totally on the management of epidemics across national borders and regarded government because the solely health actor. However, this angle has return to be seen as overly theory and excluded several important parts essential to a sturdy understanding. The recent "international health" has successively been replaced by the paradigm of "global health" that exercises a lot of comprehensive claims, and made-up the approach for rising paradigms of complexness within the twenty first Century.

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## INTRODUCTION

The covid-19 pandemic has been a huge international shock to international health, to the planet economy, and to the politics order. As we have a tendency to write, reportable deaths have exceeded four. 5million worldwide, with verity total worth maybe many times higher. Several families are impoverished. The pandemic wasn't simply inevitable; it had been expected by several commentators. However governments had didn't invest in state. Even once they had developed and tested plans that they had didn't learn the mandatory lessons. Political leaders struggled to grasp what to try to, or however seriously to require the threat. And albeit they acted decisively which few did they typically looked vainly for clarity from their scientific advisers, WHO were themselves attempting to form sense of the quickly increasing, however variable quality proof. The immediate priority was typically to forestall the health systems

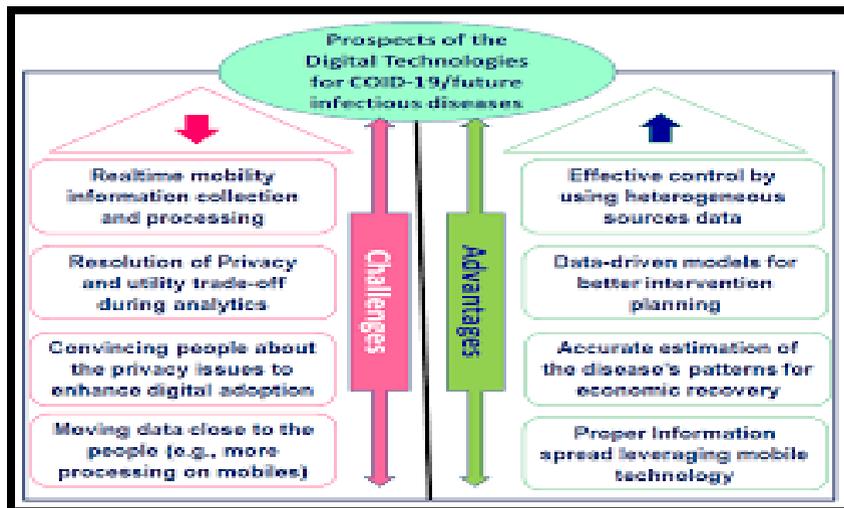
in that governments had didn't invest from collapsing beneath the pressure. Thus, the first, rather obvious lesson was that we'd like to strengthen health systems and invest in historically neglected areas, like community health and first care. Care systems were almost about brick before the pandemic, once years of asceticism and value containment. They were stretched to limit by the pandemic and had to swear nearly solely on their most significant resource: folks. It became obvious that what has been advocated by the health community for years is desperately needed: we'd like to search out ways that to recruit and retain a extremely trained and actuated men. we'd like to seem at the role of various medical examiners, of patients, and their careers, and of more and more refined technology, and choose what's the simplest thanks to give care that's alert to the requirements and expectations of patients. We have a tendency to can't merely return to doing what we have a tendency to did before.



**Chart for Social Mental and Physical Health**

Health systems face huge backlogs, with so much too many folks missing out on necessary treatment over the past eighteen months. On prime of this they need to look after those that still become infected with covid-19 and therefore the giant numbers of individuals with organ harm post infection or long covid. Several medical examiners, tired and battered, have referred to as it daily. Youngsters need to catch informed incomprehensible education. Then there's the economic harm and therefore the loss of trust in politicians, with growing proof of however pathological state creates fertile ground for advocator, discordant politicians. However w e've conjointly modified the ways in which we have a tendency to work, questioning the requirement for long daily commutes and business travel. And if additional people are to figure from home then we have a tendency to might want changes to our physical setting. Even as once previous pandemics, the planet won't be a similar once more and that we should acknowledge it. We would like a brand new paradigm. One overarching plan underpins all of the report's recommendations. The unfold of SARS-CoV-2 to humans arose, like numerous rising infectious diseases, at the interface between humans, animals, and therefore the natural setting, an area wherever the conception of Health resides. however our responses still inhabit silos,

with physicians, vets, and ecologists living in separate communities speaking totally different languages. we'd like to bring them along. a lot of progress has been created in fostering collaboration between the international organization agencies concerned, the planet Health Organization, the Food and Agriculture Organization, the planet Animal Health Organization, and therefore the international organization setting Programme. However rather more has to be done at the national and native level and, above all, within the means we expect regarding these challenges and therefore the solutions we have a tendency to propose to the common challenges. The pandemic has shone a lightweight on the fractures that existed in our societies. As politicians began to impose packages of measures necessary to interrupt transmission of the virus, they completed that giant numbers of individuals leading precarious lives once years of asceticism were unable to suits what was being asked of them. though several governments did unharness the purse strings, providing pay replacement and alternative kinds of support for those unable to figure, several still fell through the gaps. The steep social gradients and risks of infection, medical aid, and death ar testament to the challenges that several people—especially those whose lives ar precarious—have faced.



**Dig. For digital Tech for COVID-19**

There's no real alternative once the choices are either to isolate reception or earn the cash required feed one's family. Yet, in several countries, these issues are invisible as a result of we have a tendency to merely do collect the info, and particularly the info needed to reveal the stark variations related to quality. Therefore a necessary element of national resilience should be to mend the social safety nets that are torn as under. Straight forward criteria of whether or not they provide the potential to boost One Health and the way {we can| we will we are able to} produce a real partnership between the general public and personal sectors within which the risks and therefore the returns are shared.

None of this can be doable with changes to the world governance of health. The Commission's report makes many recommendations. These embrace a brand new pandemic accord, a world Health Board, modeled on

the money Stability Board created by the G20 once the world money crisis, and new pan-European structures, as well as a Health Threats Council to secure high level political commitment and a health police work network that spans the whole fifty three country European region. and that we would like new ways that of accounting for the cash spent, seeing several parts of health disbursement as AN investment, within the same means as we have a tendency to read expenditure on education and physical or digital infrastructure. The aim is to reap the advantages of this extraordinary movement and create the consequences of the shock lasting on our ability to recollect the teachings from covid-19. The Commission's proposals are welcome by several governments and have already fed into the thinking of the G20. Above all, the money sector has completed the value of failing to take a position in health and state. The doors are gap. The fight for health has unfolded on the far side borders of

the care systems. The question now could be whether or not the health community can seize the chance to enter and have interaction.

## CONCLUSION

This review has synthesized the in depth body of literature related to the historical development of PHN, its scientific underpinnings and also the series of paradigm shifts that have contributed to the evolution of PHN steerage over time, culminating within the emergence of a brand new, transformative paradigm. Major historical paradigm shifts in PHN are the transition from the muse era of nutrition to the identification of vitamins within the half of the twentieth century and so the transition to the popularity of the role of foods and dietary patterns within the development of diet-related chronic diseases within the half of the twentieth century. Currently, PHN is undergoing its latest paradigm shift associated with increasing awareness of the link between PHN and E and mediate through food systems. Critically, we've known the dynamics related to the transition from one era of PHN reach consequent, as for the most part per Kuhn's theory on the structure of scientific revolutions.

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## Pregnant in a Pandemic: Health priority, responsibility, and gender in crisis

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### ABSTRACT

With nearly 5 lakh deaths, India ranks high up on the list of nations that were troubled by COVID-19. The pressures of the pandemic were felt more heavily by sub-populations that were already on the vulnerable ends of receiving public healthcare. One such group was that of pregnant and lactating women, who got access to vaccines later than the general population. This delay was explained by the unavailability of data related to the administration of vaccines for pregnant women in India. This is unsettling only because the Euro-American vaccines (Pfizer, Moderna, etc.) had already been successfully delivered to more than a hundred thousand women, which means that official approvals of these vaccines were possible in India before they were eventually given the green signal. Israel, among other countries, made pregnant women a priority for the immunization programs, which resounds the recommendations made by India's National Technical Advisory Group on Immunization (NTAGI). This reaffirms the supremacy of the State in making the choice for its citizens in a free-market economy, which is rather desecrating because this is a matter of public health and the ramifications of non-availability, by experience, were lethal. A simultaneous shortcoming that aggravated the situation is from the demand side where the advocacy--for emphasizing the cruciality of vaccination for pregnant women, especially on account of their (and their fetus' or newborn's) comorbidities--was insubstantial and inappropriate. This paper, predicting the future of post-COVID health systems, analyzes the course India took with its policies on the issue, juxtaposes it with prominent case studies from around the world, and finally corroborates the implementation and perception of the policy's treatment on the ground with narratives of those who were violated and denied (public) care.

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## COVID-19 AND ITS IMPACT ON WOMEN IN INDIA

The COVID-19 pandemic regulated, if not completely curtailed, access to public services leading to distress that was felt at both professional and personal levels. The situation was aggravated by the mental and economic stresses induced by the boundness to domestic spaces, especially for the vulnerable sub-populations. While there was no way out of homes for a significant period of the unrest, the vaccination drives hurried and created a sudden surge in the flocks of people standing in queues outside the vaccination centres and hospitals, owing to the information asymmetry of the vitality of these vaccines in the initial weeks after its introduction. This happened even when the vaccine was rolled out in age-determined batches. This was severely worsened by the panic created around the ineffectiveness of the CoWin app, which had long waiting times for booking slots and unsuccessful translations into getting vaccinated on the actual visits. While India was one the largest manufacturers of the vaccination, the socio-economic limitations forced many in the country to face hardships in trying to access the vaccine.

The CoWin app, launched in early 2021, started with registering and providing free vaccines to frontline workers, extending the same services later to the general population. The order of preference for this public service delivery was adjourned by the policymakers. Even in the absence of such a portal registration being mandated, the fact that women are restricted at

home generally and require a greater effort to manoeuvre the public space was not taken into account. The pregnant women, as a sub-group, were faced with greater challenges, especially amidst the precarity that the pandemic was generally characterized by. Housewives, which compose the majority of pregnant and lactating women, bear the brunt of patriarchy. During the lockdown period, India recorded a 10-year high in reported cases of domestic violence. Despite the legal right, patriarchal socialisation forces women to accept life, even if filled with violence. This is reinforced by the National Family Health Survey (NFHS-4, 2015) data where one in three women reported experiencing physical, emotional, sexual, or spousal violence, and 77 percent do not report the matter to anyone. The stressors and the emerging one with COVID-19 at the time made it difficult for women, especially pregnant and lactating women, to access healthcare.

The second wave of the pandemic hit hard, exacting a heavy toll on the populations across various socio-economic backgrounds. India especially witnessed high rates of hospitalisation, with people finding it difficult to even find a hospital bed or medicine. It is during this difficult time, that the COVID-19 vaccines were introduced in a magnificent feat of global collaboration between various stakeholders. The Indian government did a praiseworthy job of ensuring that the vaccines are made available in cohorts to the populations and were speedily able to cover a wide percentage of people. However, prevalent socio-cultural and economic difficulties

made it difficult for a few vulnerable populations to access the much-needed care for prevention.

The national guidelines for pregnant women (ICMR, 2020) infected by COVID-19 identify them as a vulnerable group, accounting for the fact that pregnancy alters the immune system and the group (CDCP, 2021) is likelier to get infected with a moderate to severe disease, and require intensive care than their non-pregnant counterparts. The odds of pregnant women diagnosed with COVID-19 (WHO, 2021) virus being admitted to the intensive care unit were determined to be 62 percent higher, and the odds of needing invasive ventilation were 88 percent higher. Pregnant women (NLH, 2022) with symptomatic COVID-19 infection, when compared to non-pregnant women with COVID-19, are 3 times more likely to be admitted to an intensive care unit, 2.9 times more likely to require invasive ventilation, 2.4 times more likely to require extracorporeal membrane oxygenation, and 1.7 times more likely to die.

The impact also led to instances of pre-term delivery (considered to be three times higher than during COVID-19 times) and hypertensive disorders which act as a cause for concern for the woman and healthcare providers. This not only puts expectant mothers at risk but also their babies, facing medical complications in the womb itself. COVID-19 restricts air supply within the body, making access to oxygenated blood and a healthy placenta, difficult for the baby. Data from WHO (WHO, 2021) also showcased that the transmission of the virus from the womb or during childbirth, while rare, was possible. The case fatality rate (CFR) among

pregnant women (ICMR, 2021) and postpartum women was 5.7% during the second wave, which was significantly higher compared to the scenario encountered in the first wave with a CFR of 0.7%.

The risk categorization makes vaccination a prioritization for the defined group. The risks to pregnant women and their foetuses have continued, with a high rate of maternal mortality, stillbirth, and premature birth. Real-time scientific evidence, or lack thereof, along with reports of rare risks of blood clots, and thrombosis from the vaccines was considered the reason for state actors to allow vaccination for pregnant women. This lack of access to life-saving medication created a precarious situation where in-person consultations were critical given that certain health challenges like preeclampsia might be missed over teleconsultation but had to find a way to protect themselves from COVID that was air-borne. Reports of women not getting admitted to any hospital despite their pregnancy if they were COVID-positive, and while some with economic capital were able to afford private help, the rest found it difficult to find to navigate optimum care.

A report (UNICEF, 2021) suggested that disruptions of essential health services across South Asia due to COVID-19 may have contributed to 11,000 more maternal deaths in 2020 than the 57,000 maternal deaths recorded in 2019. These disruptions especially caused major tremors in India, where 80 percent of the South Asian population resides. The exact toll of the pandemic in terms of death rates and consequential impact might never be calculated, anecdotal evidence across media platforms

highlights the gravity of the picture for populations left behind.

The guidelines by the Ministry of Health and Family Welfare in India advised against vaccination for pregnant, lactating, and breastfeeding mothers and recommend individual practitioners follow maternal care as a priority. The denial of the constitutional right enshrined under Article 14 and Article 21 of the Indian constitution and de-prioritization of the sub-population without scientific evidence thus highlights the supremacy of the State in determining the decisions for its citizens. It was stated that evidence was required before allowing the cohort to receive the vaccination, as concerns for the child's health became paramount, discounting the lives of the pregnant women. However, women at various stages of their pregnancy are excluded from clinical trials for 'safety' reasons. Inevitably, this leads to a lack of data regarding the determination of the efficacy of the vaccine, thus leaving pregnant women out of the vaccination efforts.

Scientific evidence and global experiences highlighted the need for vaccinations and their safety. Across the globe, countries such as Australia, Canada, Israel, Singapore, the United Kingdom, and the United States led by example by vaccinating pregnant populations and witnessed positive experiences. Israel reported high hospitalization rates among pregnant women who had tested positive for COVID-19 and even developed complications due to it with their pregnancies. The Israeli government was among the first to vaccinate their pregnant and

lactating populations with the Pfizer-BioNTech Vaccine.

Post corroboration of real-time data that pointed to the inaccuracy of any suggestions related to vaccination putting pregnant women at risk, other countries followed Israel in vaccinating their women. Britain had earlier restricted vaccination access to pregnant women and lactating mothers citing exclusion from human trials as their reason. However, this was short-lived and soon Britain started administering the Moderna and Pfizer-BioNTech vaccines to pregnant and lactating populations in their country.

Despite this, India did not follow suit until June 2021. While the same vaccines were available in India, the Government stood its ground and prevented pregnant and lactating populations from getting vaccinated. Not only does this show poor judgment structurally but also the reinforcement of a categorical exclusion of women from healthcare decision-making. For pregnant women, live attenuated vaccines are contraindicated, meaning they might cause harm to the mother and foetus. (FOGSI, 2021). None of the COVID vaccines available in the market globally are live attenuated, other vaccines which may have some theoretical considerations regarding transmission are the viral vector vaccines. Research shows that infants born to mothers who receive two doses of an mRNA COVID-19 vaccine — such as the Pfizer-BioNTech or Moderna COVID-19 vaccine — might have a lower risk of hospitalization due to COVID-19 infection in their first six months of life. mRNA COVID-19 vaccines cannot cause any genetic alterations or changes within the

DNA. Viral vector vaccines such as the Janssen/Johnson & Johnson COVID-19 vaccine have been given to pregnant women in each trimester of pregnancy in clinical trials. No harmful effects were found. The Federation Of Obstetric and Gynaecological Society of India (FOGSI) stated this as their argument for including pregnant and lactating women within the ambit of COVID vaccinations, there was no reason for them to be left behind.

It was also observed that the advantages of vaccines outweigh the risks that there might be any exposure to the foetus to the number of vaccinations. The side effects of Covid-19 vaccines do not differ from any other vaccines and act as additional immunization for children. When pregnant women are vaccinated their children might be immunized before delivery, increasing chances of survival and cutting down the risk of COVID-19 infection. The antibodies may protect the baby for six months or more after birth. This is a critical period of development for the baby and increased immunization during the period boosts the chances of survival greatly. In addition, the study showed that the mother's antibodies make their way into her breastmilk, likely protecting infants from COVID-19 for at least a few days after they consume the milk.

Moving forward, it is essential that healthcare structures and systems work alongside scientific evidence and protect the most vulnerable populations. Pregnant and lactating women are among the most vulnerable population and usually are not attended to till the end in times of crisis, as evidenced by COVID-19.

While prioritizing women, it is also important to look at vulnerability through an intersectional lens. Factors such as caste, class, and sexuality are often disregarded while mapping health provisions. This must be integrated within the ambit of data collection itself. Access to healthcare provisions is even more of a challenge within communities that face social exclusion such as Dalit women, transgender individuals, and individuals from backward populations.

Gender and age-disaggregated data and information must be available for policymakers to assess the situation and develop appropriate, evidence-based responses. Such data must be collected and analysed, ideally covering several years to track changes and take corrective action. Building public awareness and expertise among both medical professionals and intersectional experts through information campaigns and training of frontline workers is also important.

Caste as an additional social factor makes it necessary to look at data through various lenses. The imbalance between the social, economic, and political capital limits access to healthcare for those at the lowest rungs of society. This is particularly true for Dalit women who face both gender and caste-based discrimination, disrupting access and stifling their voices. Hence, their voices must be brought to the forefront, and conversations of systemic change must include these.

In a world trying to recuperate and rebuild itself post-pandemic, it becomes pertinent to create more robust public structures, particularly in the health sphere. Caregiving must be revisited to be made more inclusive to ensure preparedness. The state must look at building robust health systems that are prepared to bounce back from emergencies like COVID-19. This means spending more time and resources on detecting possible disease outbreaks, continued vaccine development, and strategies to deploy them effectively keeping in mind different socio-economic strata.

Multisectoral and stakeholder engagement is essential to ensure that different perspectives are considered and responsibility is shared. This not only ensures accountable systems are in place but also well-managed supply chains and distribution systems. It becomes clear that essential goods and medical equipment such as oxygen-related equipment, blood banks, and hospital beds must be arranged for in anticipation of massive caseloads as witnessed in the second wave of the pandemic. Along with these, a strong judicial system that works proactively to protect the interests of citizens must be in place. Current bodies must be strengthened and regulatory bodies must be set up to support them. Unless these regulatory bodies work in tandem with the legal structures, lapses are unaccounted for and lives are lost.

The coming together of multiple stakeholders is imperative to ensure the healthcare system is strengthened and women are not left behind in emergency situations like the COVID-19 pandemic.

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