ROLE OF HEALTH INFRASTRUCTURE IN CONTAINING THE PANDEMIC – DECODING THE STIGMA

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Introduction

Coronavirus Disease 2019 (COVID – 19) is an infectious disease originated in the Wet market of Wuhan, Hubei, China in November 2019, thereby earning this name on 11th February 2020. From that day onwards this disease has proliferated throughout the world and it was declared Pandemic by WHO on 11th March 2020. Every country in the world, no matter developed or underdeveloped, is using every possible way to contain this pandemic which has taken above 7 lakh lives around the world. (Till 7th August, 2020; Source: WHO).

With the rising fatality rate in the countries, a perception formed in everyone's mind that fatality rate is indirectly proportional to health infrastructure in the country. Does this perception hold truth? Invigorated by this question, we decided to research the health infrastructure of meticulously selected 12 nations; their health infrastructure and fatality rate and tried to find a correlation between health infrastructure and the Corona fatality rate which could prove the role of health infrastructure in containing the pandemic. This paper provides you a thorough journey of research methods we used and conclusion. But first, we need to understand what health infrastructure is and what it includes.

Health Infrastructure

Public health infrastructure provides communities, states, and the Nation the capacity to prevent disease, promote health, and prepare for and respond to both acute (emergency) threats and chronic (ongoing) challenges to health. Infrastructure is the foundation for planning, delivering, evaluating, and improving public health. Health infrastructure includes all health-related infrastructure that a country possesses (HealthyPeople.gov). Be it advance machines, number of physicians, number of nurses, number of beds, expenditure on health or other such paraphernalia. An advanced health infrastructure provides the country an edge over countries with less advanced infrastructure in preventing diseases, better standard of living and low mortality rate. Health infrastructure lays the foundation of planning and strategizing to face any kind of health situation in the country.

In order to keep the health infrastructure relevant to our study, we decided to take on the factors that affect the situation of pandemic in our country i.e. no. of beds (per 1000 person), no. of physician (per 1000 person), no. of nurses (per 1000 person), Density (P/Km2) and tests (per 1000 person).

Next, we will have a look at the objective of our research.

Objective

This study aims at articulating the role of health infrastructure in containing the pandemic by drawing out a comparison between countries on the basis of their Health

infrastructure, mainly comprising of Hospital beds (per 1000), Current Expenditure on Health, Nurses (Per 1000), Physicians (Per 1000), Density (P/KM^2) and Tests (Per 1000); all these are the factors that affect rate of recovery of patients, rate of Infection etc. This comparison allows us to identify the countries that lagged behind despite having the best resources and countries with poor resources who managed to keep the situation in check.

Criteria for Choosing the Countries

This research paper looks at the trajectory of the effects that COVID-19 has had on different countries with different parameters of health services. By gauging the level and quality of healthcare departments of countries, the paper draws and detects the correlation between the health infrastructure of a country in terms of COVID-19 and its effect. The countries have been chosen consciously; keeping in mind the necessity to cover a large range. Thus, spanning from developed superpowers to countries which are still developing, the paper has manifested all possibilities in a nutshell. Moreover, countries which are/were worst affected by the virus have been given place to further enlarge the prospects of the paper. In terms of hospital beds, emerging European countries like Germany, Spain, France, and Italy have been taken into consideration, some of which were badly affected by the COVID-19 in economic and social terms. Australia, an island country, has also been added for greater representation. Not forgetting the hegemonic power of the US and competing nation Russia, the paper includes developed countries on one and stifled countries on the other. For instance, terror-stricken Iran.

Asian countries like Singapore and India have been included as these are one of the worst affected countries. India being the growing economy as it is, its place marks an important role. A close observation portrays how less India spends on its health sector compared to how large its population is. It was also important to keep in the list, a geographically large country like Canada. Our erstwhile colonizer, the United Kingdom gets a spot too, for the rapid rise in their number of cases caught international attention.

Research Methodology

The requirements of this research recommend a promising methodology to fulfill its objective: identifying key components and countries to explore, pinning down data requirements, collection of data, maneuvering it as per the need and probing into the output yielded.

The data for the research purpose has been collected from the official sites of WHO, World Bank, OECD and many other sources which collect their data from the countries themselves, hence secondary data has been used extensively.

Six major factors have been chosen for study and relevant data has been collected, these are as follows:

1. Number of hospital beds (per 1000).
2. Number of physicians (per 1000).
3. Number of nurses and midwives (per 1000).
4. Population density (per square km).

5. Current expenditure on health as percentage of GDP.
6. Number of tests for corona, as on August 4, 2020.

The official sites and online articles publish the latest data of 2018 for the 1st five factors, therefore in order to compare the data with the cases in 2020; the data for 2020 has been extrapolated using LINEAR REGRESSION (In statistics, linear regression is a linear approach to model the relationship between a scalar and one or more explanatory variables; we have used Microsoft excel as a tool to model the relationship between year and data for the factors) . The data for the number of tests was available and hence no further extrapolations were done to it.

In order to calculate the case fatality rates, the number of deaths due to the virus has been divided by the total number of cases.

Following tables; Table 1 shows the data for each parameter for each country for year 2020 along with a benchmark standard for each parameter and Table 2 presents us the fatality rate for each country.

Further, countries have been allotted scores taking WHO standards as the benchmark. More details are presented in the SCORING section. Using the derived scores and case fatality rate, a matrix has prepared, and all the 12 countries have been classified into different categories for comparison.

Scoring

For the purpose of allotting scores to the countries for each factor, the collected data has been sorted country-wise and factor-wise.

Benchmarking was found to be the most suitable technique to allot the marks to the countries. In this technique, a benchmark is set as standard and then something else is evaluated against that standard. We further have allotted scores to the standard and a country's score is proportionate to the difference in the standard and data for that country for that particular parameter. For ex- Standard set is 5 for a particular parameter and score allotted at this standard is 5. The country X's data for this particular parameter is 8, so the score for that parameter for country X will be (8*5)/5 = 8 (Formula is explained in the following paragraph).

The WHO standards for each factor taken have been set as benchmark, and in case of Current expenditure and Number of tests, where the standard was not available; the median of the data of all countries has been taken as benchmark.

The score at the benchmark has been set equal to 5 and maximum score has been set equal to 10 and the following formula has been used to calculate score:

(Extrapolated data (2020) × Score at the benchmark) / Benchmark

In order to calculate the scores for population density, it has been taken into consideration that unlike other factors, the lesser the numerical value for population density, the better the score will be. Hence, the following formula has been used:

10 - (Extrapolated data (2020) × Score at the benchmark) / Benchmark

The scores of all factors have been added for each country on the assumption that all factors have equal weightage and hence, a composite score has been obtained.

Table 3 shows calculated individual score according to the formulas written above and total score for every country.