Economic Growth and Public Expenditure: A Case Study of Union Territory of Puducherry

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Introduction

It has been widely recognized that human resource plays an important role in determining the standard of living and quality of life of the people which in turn influences the economic development of countries. One among the various factors that determine the quality of human factor is Health, as human health has its own impact on social and economic behavior of the society. Hence, the domain of health and health related issues constitute fascinating and substantive area of research for economists drawing special attention from the past two decades.

Human resources development and growth process are determined by health. A healthy community is the infrastructure upon which an economically viable society can be built upon. The people should ultimately attain a kind of social security which makes them fully secured for the rest of their life. Health is considered as an asset and plays a prime role in bringing out happiness. As the economy is advancing from lower levels of development to a higher level, government as well as the people have began to realize the relative importance of health and health care and also the various other factors that are associated with improving the overall health status of its masses.

A healthy reasonable life span which is relatively free from morbidity and illness goes a long way in ensuring the individuals' well being in general and country's development in particular as it gets reflected on the quality of life of individuals in a society.

The awareness with regard to the improvements in health also assumes considerable importance as it plays a vital role in providing the prosperity and development of the society.

In our country this awareness among the people has started to gain importance ever since the Bhore Committee Report which has laid emphasis on planned development of a comprehensive, equitable, nationwide network of health services (Bhore Committee Report, 1946).

1.1. Problem Setting

Health is the major social input for the economic and social up lift of the society. It is a national asset; it is to be emphasized to attain sustained economic and social development. Also Health is vital for ethical, artistic, material and spiritual development of human being. Hence it is the role of Government to implement quality programmes to improve the quality of the population so on to ensure productive human asset.

Health services are given continuous importance by the Puducherry government for the improvement of socio-economic status of the society. The percentage of expenditure continues to increase every year in this regard. The compositional changes in health expenditure, the relationship between health expenditure and economic growth, the impact of public expenditure on health are the main causes that are focused by the researchers in this study. The analyses have been done with the help of the data collected from various sources of health department. Hence the present study made an attempt to study health expenditure and economic growth in the Union Territory of Puducherry.

1.2. Objectives of the Study

1) To study the compositional changes in health expenditure of the Union Territory of Puducherry.

2) To understand the relationship between public expenditure on health and economic growth of Puducherry.

1.3. Data Source and Methodology

The health system of the Union Territory of Puducherry is taken for the study. This study is based on secondary data only. The study covers the period from 1960 to 2009. The

data have been collected from the various sources like Abstract of statistics, Hand Book of Statistics, and Annual Reports of Planning Department.

The data collected were analyzed with the help of statistical tools such as ratios and percentages. The growth rate estimated by using the simple regression model (10 years time series data in 2000-2001 to 2009-10) and multiple regression model (30 years time series data in 1980-81 to 2009-10) of following form:

1. Health expenditure = f (Total Government Expenditure, NSDP at current price)
2. Health expenditure = f (per capita income at current price, total population, Education Expenditure)
3. Infant Mortality Rate = f (Primary Health centre, Education Expenditure, Sub-centre Rural)
4. GSDP at current Price = f (Health expenditure, Educational expenditure)
5. PCI at current price = f (Per capita health expenditure, per capita Education expenditure)
6. Using the log model: Infant Mortality Rate = f (Health Expenditure)

Equations:

$$y = \alpha + \beta X + \varepsilon$$

$$y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \varepsilon$$

Where,

Y = Total Health Expenditure/Infant Mortality Rate/ GSDP at current price/ PCI at current price

X = Health Expenditure (using the log model)

X_1 = Total Government Expenditure/ Per capita income at current price/Primary Health centre/ Health expenditure/ Per capita health expenditure

X_2 = Net State Domestic Product at Current Price/ Total Population/ Education expenditure/ Educational expenditure/ per capita Education expenditure

X_3 = Education expenditure/ sub-centre Rural.

$\beta 1, \beta 2, \beta 3$ = Slope co-efficients

α = Intercept

ε = Residuals

1.4. Limitations of the Study

The study was confined to the information pertaining to the period of 1980-81 to 2009-2010. The variables observed for the analysis are limited due to lack of time. The results cannot be generalized as they are applicable only to the selected area.

1.5. Socio-Cultural and Economic Factors of Health

Poverty continues to be the greatest hurdle in ensuring good health in developing countries. Poor health makes the poor into absolutely poor, which in turn pushes them back into poor health status. Unavailability of food, malnutrition, poor sanitation, illiteracy, inadequate and ill-constructed housing, unemployment, poor working condition, etc., also target the poor and the other marginalized communities specifically.

Despite the commitment to 'Health' for all enormous health problems among Indian population especially the vulnerable population suffering form spatio-stratal deprivations, continue to exist. Though the mortality rate has shown declining trend standard of living of the poor are still worst in the world. The major obstacles for health promotion are insufficient resources, lack of integrated support, and poor diseases awareness etc. This sector needs heavy investment.

In India only less than 10 percent of population has health coverage. These sections of the people have shown higher level of mortality, malnutrition and fertility than the rich society. The National sample survey 52nd round calculates that the poor-rich risk ratio is 2.5

infant mortality, 2.8 for under five mortality, 1.7 for underweight. The World Bank study reports that the main reason for not seeking care is cost for the poor. The trends in health indicators from 2000-2009 are shown in Table 1.1

Table 1.1

Trends in Health Indicators of India: 2000 -2009.

(Per '000 population)

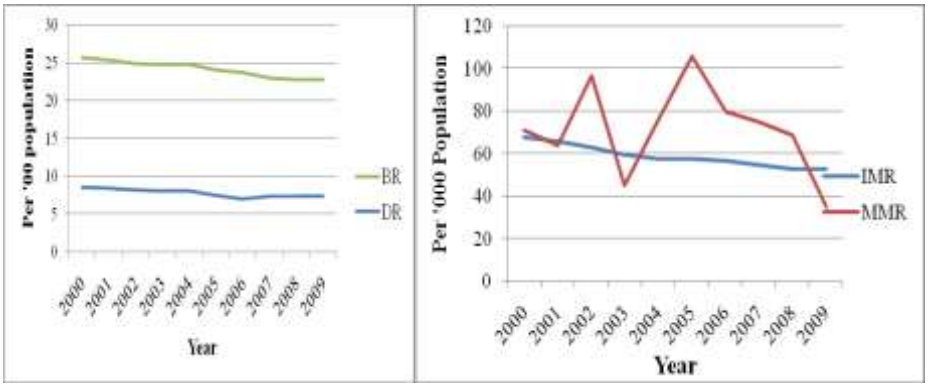
Year	Birth rate	Death rate	Infant Mortality Rate	Maternal Mortality Rate
2000	25.8	8.5	68	71
2001	25.4	8.4	66	64
2002	25.0	8.1	63	97
2003	24.8	8.0	60	45
2004	24.8	8.0	58	76
2005	24.1	7.5	58	106
2006	23.8	7.0	57	80
2007	23.1	7.4	55	75
2008	22.8	7.4	53	69
2009	22.8	7.4	53	35

Source: "Department of Health and Family Welfare in Union Territory of Puducherry[1]"

It may be seen from the Table that the India birth rate during this period has declined from 25.8 to 22.8 which the death rate from 8.5 to 7.4. While the Infant Mortality Rate has declined from 68 to 53, the Maternal Mortality Rate has fallen fur 71 to 35 during the period form 2000-2009.

Graph1.1. Birth rate and Death rate **Graph1.2. IMR and MMR**

[1] http://health.puducherry.gov.in/Health%20indicators.htm



Graph 1.1 and graph 1.2 shows that the India birth rate, dealth rate, Infant Mortaltiy rate and Maternal Moraltyhity rate declining trend in during the period form 200-2009.

1.6. Health Policy in India

Government of India Policy on Health Development

The 1983 National Health policy (NHP) focused the health profile of India with integrated and comprehensive approach supported by medical education and research. This policy has given importance to Primary Health Centre (PHC). The VII plan targets aimed at the establishment of health infrastructure in rural area. The VIII plan (1992-97) focused on human development with increase in health status and population. The National Health policy (NHP) suggested that nutrition status is to be focused urgently. The NHP of 1993 was formulated with long term and short term strategies.

India has accepted the recommendation of the International Conference on Population and Development (ICPD) 1994 and has also ratified various international conventions for securing equal rights for women. Following this India formulated a Plan of Action for children in 1992 with actions directly and indirectly affecting child health.

Despite the commitment to 'Health for All', enormous health problems still need to be addressed. While overall mortality has declined considerably, living standards are still among the poorest in the world. The major constraints facing the health sector are lack of resources, lack of an integrated support, poor involvement of NGOS, inadequate laboratory services, poor disease surveillance and response systems, and the heavy investments needed in dealing with non-communicable diseases.

There has been an increase in mortality through 'lifestyle disease' – diabetes, cancer and cardiovascular diseases. The increase in life expectancy has increased the requirement for geriatric care. In 1983 the government wanted to change the circumstances relating to the health sector of the country to formulate a new policy framework as the national health policy, in 2001. The NHP, 2001 attempts to set out a new policy framework for the accelerated achievement of public health goals in the socio-economic circumstances currently prevailing in the country.[2]"

1.7. Determinants of Health Status

The health status is usually determined by three sets of factors namely, promotive, preventive and curative factors. Promotive factors are those which promote good health, namely, nutrition, better hygiene, good sanitation, and water supply. Preventive factors such as vaccination help to prevent the spread of diseases, while the curative factors tend to cure the diseases. The availability of medical infrastructure in the form of hospitals, doctors, nurses, medicines, beds and equipments belong to this group to cure the diseases.

The availability of medical infrastructure in the form of hospital, doctors, nurses, medicines, beds and equipments belong to this group. An analysis of these factors helps to assess the health status of a nation. The health status of the population is but a reflection of the socio-economic development of the country. Economic and social development breaks the vicious circle of poverty and ill-health. As generally acknowledged, the agricultural and industrial revolution, followed by public health revolution and finally medical revolution in the sequential order, let to the improvement in the health status of the population in the present day advanced countries.

According WHO-ILO joint reports the health status of the people is determined by factors like housing, sanitation, nutrition, personal factors, educational status and occupational environment. Generally speaking, the determinants of health are population,

[2] Mohan Advani and Mohammad Akram (2007), "Health Concerns in Indian", Health Dynamics and Marginalised Communities, Rawat Publications, PP. 1-25)

poverty, per capita income, income distribution, employment education, women education, environment, housing, sanitation, water supply, health consciousness, personal hygiene, and coverage and accessibility to medical facilities.

1.8. Health Expenditure and Economic Growth

Good health is thus essential for happiness as well as for the efficient participation of people in various economic activities. Better and improved health contributes to the productivity of the people on the one hand and on the other it increases the national wealth which is considered to be an important indicator of economic growth. Hence, health is placed second to education among the various social services rendered to the people by the government for it is considered as an important tool to achieve rapid economic growth on the one hand and an integral part of welfare.

Health expenditure and economic growth are intimately linked through a positive or directional relationship. As pointed out by Grossman "Health as a good is desired to enhance wellbeing and utility and emphasizes also its function in improving individual labour productivity and production in the economy" (Grossman, 1972). High level of health expenditure on health automatically gets reflected in better health of the individual by the way of increased efficiency, reducing productivity loss, increased mobility and low rate of morbidity among the people which rises the level of capital formation that can be achieved only by the way of skilled labour force thereby contributing better towards national wealth by the way of increased income.

Similarly economic growth in turn also acts as an important factor to improving the overall health facilities of the people. With higher income there is more money to be spent in both the public and private sector by the individuals on the one hand, and on the other, there are high level of investment by the government in basic infrastructure, accesses to good and safe drinking water, better health education so that it creates awareness among the people to combat disease. This implies that there exists a causal relation between health expenditure and economic growth in either or both directions or sometimes there may also be an independent relationship between both. From the above controversial issue it is quite clear

that there arises a need towards examining the elusive relationship between health expenditure and economic growth.

1.9. Growth in Health Expenditure

There has been considerable increase in plan and non-plan expenditure on health in Union Territory of Puducherry as seen in Table 1.2

Table 1.2 Growth of Health Expenditure in Union Territory of Puducherry 1980-81 to 2009-10

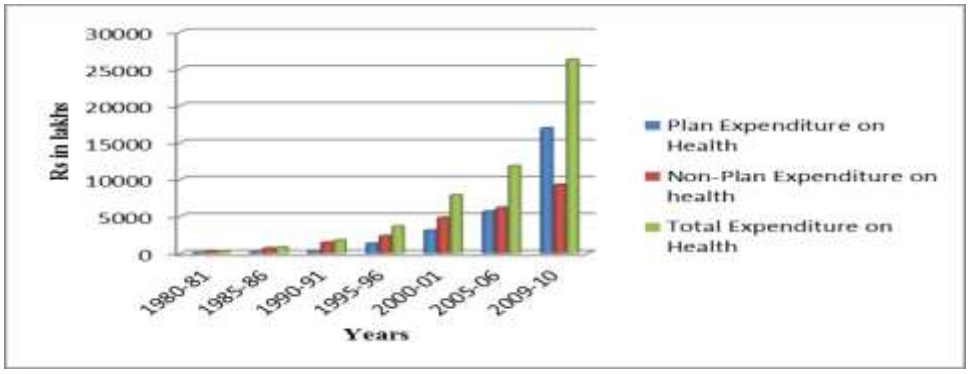
(Rs in lakhs)

Year	Plan Expenditure on Health	Non-Plan Expenditure on health	Total Expenditure on Health
1980-81	44.56	242.73	287.29
1985-86	133.68	678.13	811.81
1990-91	326.85	1451.7	1778.55
1995-96	1311.84	2344.63	3656.47
2000-01	3096.17	4797.73	7893.9
2005-06	5665.74	6167.81	11833.55
2009-10	16934.49	9292	26226.49

Source: Planning and Research department and Statistical department in Union Territory of Puducherry.

It may be seen that the expenditure on health which was Rs 287.29 lakhs in 1980-81, escalated to Rs 26226.49 lakhs in 2009-10. The growth in health expenditure is shown graph1.3.

Graph - 1.3



Review of Literature:

Following articles were reviewed for the present study.

Paul W. Newacheck et.al (2003)[9], examined the spending patterns in health care sector for U.S adolescents, aged 10 to 18 years. Based upon the National Representative Household Survey data and an out-of –pocket expenditure pattern of 4882 adolescents, study concluded with a significant benefit of further expansions of public and private health insurance coverage towards the expenditure in health care.

Amy K. Taylor et.al (2006)[13], studied, the use and expenditure pattern of women's health care in USA in relation to their social, economic and physical attributes.. Based upon the cross sectional data from 2000, it explained a comparative care pattern of white women & black and Hispanic women. This paper concluded that to improve the quality of health care all women it is important for policymaker to make better utilization and expenditure for medical care, and the health programs are essential to help identify, understand the causes of, monitor and eventually eliminate disparities.

Sonia Bhalotra (2007)[18], evaluated the impact of public intervention in the form of state health expenditure on infant mortality rate, with given state income during the period 1961-1999. Using the secondary data, from the sources like, National Family Health Survey of India, etc, this study was conducted through static distributed lag model. As the paper found long-run elasticity of 0.24 shows a significant impact of variation in state health expenditure on the risk of infant mortality in rural India, at a given state income over the period of analyses.

Paula veiga (2008)[19], envisaged the role of out-of-pocket health care expenditure in health care services in Portuguese adults on overweight and obesity. The study was based upon the individual data from two waves namely, the National Health Survey of 1995-96 and another survey on 1998-99. By using models like, probit model, ordinary Least Square (OLS) the study suggested for a scientific framed initiatives to curb the excess burden of out-of-pocket expenditure on over weighted Portuguese adults compared to normal adults.

James Bukeya (2009)[23], tried to establish causal relationship between individual health care expenditure and economic prosperity measured by Gross state product in the southeast United States. Through a Multivariate time series analysis, this method using, unit root test, Agumented Dickey-fuller test, VAR analysis, attempted give a scientific shape to the relationship between economic growths to the personal health care expenditures. Whereas, the Multivariate time series analysis found a weak but positive relationship, the VAR analysis confirm with a exact positive relationship between positive personal health care expenditure to economic prosperity.

4.10. Model Results

Equation – 1: Determinants of Health Expenditure

Health expenditure = f (Total Government Expenditure, NSDP at current price)

$$Y = \alpha + \beta 1X1 + \beta 2X2 + \varepsilon$$

Where,

Y = Total Health Expenditure, α = Intercept, X_1 = Total Government Expenditure, X_2 = Net State Domestic Product at Current Price, β_1, β_2 = Slope of co-efficients, ε = Residuals

Health expenditure = 412.52*[3] + 0.0096 X_1*[4] + 0.0174 X_2 ***[5]**

[3] 10 % level of significant

[4] 1% level of significant

[5] 1% level of significant

The above function explains the influence of Government Expenditure and State Income on Health Expenditure. The co-efficient of determination, namely, R^2 is very high at 0.98 which means that 98 percent variation in Health Expenditure is explained by the Government expenditure and state income.

This implies that the function fitted is very good and its explanatory power is also good. The Co-efficient representing Government expenditure is positive and highly significant. Its value of 0.0096 implies that Rs 1 increase in Government expenditure gives a variation of Rs 0.0096 in health expenditure. When government increases its expenditure, it reflected in health expenditure also. That is how the positive relationship is explained. The co-efficient representing state income is 0.0174 which is also positive and significant at 1% level of probability. This indicates that 1% increase in State Income contributes to Rs 0.0174 increase in health expenditure. State income provides the ability to Government to spend more on heath expenditure. State Income and the total government expenditure show a greater increase in health expenditure

Equation: 2

Health expenditure = f (per capita income at current price, total population, Education Expenditure)

$$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \varepsilon$$

Where,

Y = Total Health Expenditure, α = Intercept, X_1 = Per capita income at current price, X_2 = Total Population, X_3 = Education Expenditure, β_1, β_2, β_3 = Slope of co-efficients, ε = Residuals

Health expenditure = 0.13 X_1 *[6] - 0.0008 X_2*[7] + 0.3195 X_3 ***[8]**

[6] 1% level of significant

[7] 10% level of significant

[8] 1% level of significant

The results show the positive influence of per capita income and education expenditure on the total health expenditure. R^2 value suggests that 97% of variation in health expenditure is explained by the three variables included in the function. The co-efficient representing per capita income is 0.13 which means that 1 Rupee increase in per capita expenditure leads to Rs.0.13 increase in health expenditure. Per capita expenditure being an indicator of economic growth shows the power of the Government to spend on health expenditure. This explains positive and significant value of health expenditure. The co-efficient representing educational expenditure is also positive and highly significant at 0.3195 which implies that 1 Rupee increase in educational expenditure is accompanied by an increase of Rs 0.3195 in health expenditure. Because for Human Resource Development both education and health have to go together the simultaneous interaction between educational expenditure and health expenditure is seen here. But the surprising negative relationship between population growth and health expenditure is inexplicable. The co-efficient value of population is 0.0008 and it is not very significant. This implies that irrespective of the growth of population or otherwise, the Government is spending on health expenditure.

Equation – 3: The determinants of Infant Rate (IMR)

The infant Mortality Rate which is an indicator of Health Status of a Region is influenced by several factors. The influence of these factors is tested with the help of the following equation and the results obtained there on:

Infant Mortality Rate = f (Primary Health centre, Education Expenditure, Sub-centre Rural)

$$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \varepsilon$$

Where,

Y = Infant Mortality Rate, α = Intercept, X_1 = Primary Health Centre, X_2 = Education Expenditure, X_3 = Sub-centre Rural, β_1, β_2, β_3 = Slope of co-efficients, ε = Residuals.

Infant Mortality Rate = 47.87* [9] - 0.1917X1 *** [10] - 0.0002X $_2$** [11] - 0.1467X$_3$ *** [12]**

The results show that three variables included in the function, namely, primary health centres, Education expenditure and the number of sub centres in rural areas account for 81% variation in Infant Mortality Rate as revealed by the Co-efficient of determination (R^2) at a value of 0.81. Further, the coefficients have expected signs. The coefficient of primary health centre at value of 0.1917shows that one unit increase in primary health centre causes a decline in IMR by 0.1917 units. This result is natural because increased primary health facilitates health and acquires more health packages which induce declining IMR. The other coefficient representing education expenditure is also significant and negative. The value of this coefficient at 0.0002 indicates that one unit increase in educational status is represented by educational expenditure with case reduction in IMR by 0.0002 units. Increase in education and literacy levels promote health awareness which is one of the critical factors in promoting health which reflects in low IMR. The coefficient representing the sub centres is also negative and highly significant. Its value of 0.1467 shows that one unit increase in sub centre reduces the IMR by 0.1467. With the decline in IMR, there is enhancement of the health status.

Equation- 4: **Impact of Health Expenditure on Health status**

It is presumed that the Government expenditure on health by improving the health facilities and health personnel would have a determinate influence on health status and reducing Infant Mortality Rate. This relationship is explained by the following equation and the result and the results given.

$$LOG(Y) = \alpha + \beta LOG(X) + \varepsilon$$

Where,

[9] 1 % level of significant

[10] 1 % level of significant

[11] 5 % level of significant

[12] 1 % level of significant

Y = Infant mortality Rate, X = Total Health Expenditure, α = intercept, β = Slope of co-efficient.

Log (Infant mortality Rate) = 4.4768 *[13] - 0.1193LogX ***[14]**

The regression results show that the equation fitted explains 74% variation in Infant Mortality Rate by increasing Public Health Expenditure. The co-efficient value of Public expenditure as expected is negative and significant. Its value of 0.1193 implies that 1% increase in health expenditure reduces Infant Mortality Rate by 0.1193 points. This result, as expected is natural. Growing public expenditure provides the ability to the Government to augment public health facilities and promoted good health which reduces the Infant Mortality Rate.

4.11 Major Findings of the Study

Health expenditure is positively related with Government expenditure, NSDP, education expenditure, per capita income and schemes wise expenditure on health in Union Territory of Puducherry.

- Economic growth (GSDP at current price, per capita income) is positively related with health expenditure, education expenditure, per capita health expenditure and per capita education expenditure in Union Territory of Puducherry.

- Infant mortality rate is negatively related with health expenditure, Primary Health Centre, Education Expenditure and Sub-Centre Rural in Union Territory of Puducherry.

- The Government expenditure and NSDP are found to be significantly and positively associated with total health expenditure Union Territory of Puducherry.

[13] 1 % level of significant

[14] 1 % level of significant

- A rise in per capita income at current price, Education Expenditure has significantly positive impact on the total health expenditure. But the Population growth has a significant but negative impact on health.

- The establishment of more Primary Health Centres, expenditure on health education and training, spending on rural health posts and Sub-centre have significantly negate the impact on the morbidity pattern and Infant Mortality Rate.

Policy Implication:

- As the study found an irregular trend in the health expenditure over the study period, there is a need to give emphasis on the spending of the Government to provide basic and minimum health needs to the people of UTP. In order to achieve the objective like "Health for all" Government should give emphasis more on the grass root level of development of health institution in the Territory.

- Since there are number of determinants to govern a good state of health, the government must not ignore all those schemes for the development in the form of environment, sanitary condition of the people and the availability of drinking water under its budgetary allocation in order to develop the health status of the people of UTP,

- With a mushrooming of private Hospitals and Nourishing Homes over UTP most of the people have their confidence with the private treatments. On the other hand, especially, people belonging to economically backward classes depend upon the Governmental health provisions. Therefore government should allocate the resources under the hospital management in such manner that maximum of its benefits channelize for the development of Government hospitals especially with the provision of skilled manpower, additional beds and drugs.

- However, a key drawback is lack of skilled manpower and quality services with most of the Government hospitals as compared to the private hospitals. Therefore

Government must pay heed on the schemes related to the health education and training, opening of more Nourishing training institutes.

- In the present scenario, where all the existing health institutes trying with cutting edge technologies to grab a major share of the market, Government must not ignore the other than allopathic system of medicine like Unani and Naturopathy.

5. Conclusion

Over the period, even after strong and active initiatives of the Government of India and the administration of the UTP on the development of the health status of the people, still there is much to achieve. The spending of the government on various social infrastructures including health, no doubt have an impact on the scaling up of the state of health over UTP with a decline in Infant Mortality Rate and Maternal Mortality over the study period. In spite of the increasing number of hospitals, more state of art technologies and considerable initiatives of the Government through its expenditures on the health provisions, still the Government has to do with the morbidity and disease pattern. Towards this end, Government should give more emphasis on the development of infrastructural facilities like establishment of Primary Health Centers, Paramedical Institutions, doctors, beds and the availability of life saving drugs.

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