MAJOR FINDINGS AND POLICY IMPERATIVES

Major Findings:

Major findings of the present study are presented below;

- The resource allocations have made positive impact on development of public healthcare institutions.
- There is positive relationship between economic development and human healthcare infrastructure.
- GSDP has been significantly increased in Karnataka at higher rate compared to growth of PCGSDP.
- Capital expenditure on health in Karnataka has been significantly increased in Karnataka at higher rate compared to growth of revenue expenditure on health. Hence, it has been revealed from the growth analysis that the government of Karnataka has given more importance to create physical infrastructure compared to human infrastructure.
- The growth of hospitals in Karnataka is significantly high compared to other parameters namely, hospital beds in Karnataka, hospitals beds in PHCs of Karnataka and PHCs in Karnataka. Accordingly, government of Karnataka has given more importance to build hospitals than providing beds at state level. At the same time, less importance has given to construct PHCs and given more importance to provide beds in existing PHCs. The similar phenomenon has been observed in Mandya district that less importance has given to construct primary health centers and given more importance to provide beds in existing primary health centers.
- Growth of doctors is relatively significant in Karnataka, though it is less than the growth of hospitals.
- PCGSDP, revenue expenditure, and capital expenditure on healthcare have significant influence on hospitals. Accordingly, the increases in hospitals have been significantly depending upon PCGSDP, revenue expenditure, and capital expenditure on healthcare. Hence, the growth of hospitals depends on the growth of the economy and its contribution to healthcare sector in the form of both revenue and capital expenditure. Therefore, there is a need of revenue and capital allocations for healthcare sector to increase the number of hospitals.
• PCGSDP and capital expenditure on healthcare have not significantly influenced beds in hospitals. Accordingly, the increases in hospitals have not been significantly depending upon PCGSDP and capital expenditure on healthcare. However, revenue expenditure has been significantly influenced beds in hospitals. Hence, the growth of beds in hospitals depends on the growth of revenue expenditure on healthcare sector. Therefore, there is a need of revenue allocations for healthcare sector to increase the number of beds in hospitals.

• Revenue and capital expenditure on healthcare have not been significantly influenced PHCs. Accordingly, the increases in hospitals have not been significantly depending upon revenue and capital expenditure on healthcare. However, PCGSDP has been significantly influenced PHCs in Karnataka. However, the rate of change in PHCs due to change in PCGSDP is very low. Hence, the growth of PHCs depends on the growth of the economy and not the allocation of revenue and capital expenditure. At the same time, growth of PHCs has been also depends on other variables other than the variables included in the above model. Therefore, there is a need of overall development of the economy to increase the number of PHCs in Karnataka.

• Revenue and capital expenditure on healthcare have not been significantly influenced the number of doctors in Karnataka. Accordingly, the increase in number of doctors in hospitals of Karnataka has not been significantly depending upon revenue and capital expenditure on healthcare. However,
PCGSDP has been significantly influenced number of doctors in Karnataka. And, the rate of change in number of doctors in hospitals of Karnataka due to change in PCGSDP is also relatively high. Hence, the growth of doctors in hospitals of Karnataka depends on the growth of the economy and not the allocation of revenue and capital expenditure. At the same time, growth of number of doctors has been also depends on other variables other than the variables included in the above model. Therefore, there is a need of overall development of the economy to increase the number of doctors in hospitals of Karnataka.

- It has been found from the research that growth of capital expenditure on healthcare and growth of significantly high in Karnataka compared to other parameters used in the chapter. It has been also proved by the analysis that only hospitals have been constructed with efforts of government and the growth of the economy. Beds in hospital have been also depending on the revenue contributions of the economy. But, growth of PHCs, beds in PHCs and doctors in Karnataka have not been depending upon government efforts or contribution and these parameters have been depending only depending upon the growth of the economy and not the efforts of government. In other works it can be argued that the efforts made by the state government in the form of revenue and capital expenditure is insufficient to influence these parameters; PHCs, beds in PHCs and doctors in hospitals.

- It has been proved by the analysis that the healthcare facilities are very poor in Belgaum and Gulbarga division compared to Mysore and Bangalore division.

- The study identified between choice of hospitals and taluk. Therefore, there is significant change in choice of hospital based on taluk. Accordingly, in Mandya and Pandavapura taluks majority of the people have chosen public hospitals for health reason, in K.R. Pet taluk majority of the people have chosen both public and private hospitals for health reasons. Hence, region has significant impact on choice of hospitals. At the same time, it has been proven by the research that choice of hospital has been associated with many factors and region is one among them and accessibility of reliable quality of service is also one among them. Therefore, public healthcare facilities have been adequately provided in urban and nearby urban places. Accordingly, people in Mandya taluk and Pandavapura taluk have chosen government hospitals.
The study identified has been association between distance to hospitals and taluk. Therefore, there is significant change in distance to hospital based on taluk. Accordingly, in Mandya and Pandavapura taluks majority of the people have hospitals near to their homes, in K.R. Pet taluk majority of the people do not have hospitals near to their homes. Hence, region has significant impact on distance to hospitals. Therefore, public healthcare facilities have been adequately provided in urban and nearby urban places. Accordingly, people in Mandya taluk and Pandavapura taluk have better availability of hospitals compared to K.R. Pet taluk.

Association between number of doctors in hospitals and taluk has been found from the study. Therefore, there is significant change in availability of doctors in hospital based on taluk. Accordingly, availability of doctors is relatively and significantly more in Mandya taluk compared to Pandavapura and K.R. Pet taluk.

Availability of 24 X 7 service are though very low relatively more in Mandya taluk compared to Pandavapura and K.R. Pet taluk. At the same time availability of free medicines are relatively more in Pandavapura and K.R. Pet taluks compared to Mandya taluk.

It has been found from the survey that none of the respondents have utilized the Aam Admi Bhima yojana in Mandya district and there are no differences among the selected taluks of Mandya district.

Common diseases are relatively and significantly more in K.R. Pet taluk, and blood pressure patients are more in Pandavapura taluk. In Mandya relatively within the taluk, common diseases, blood pressure and diabetic problems are more.

According to 97 percent of people in Mandya and Pandavapura taluks medical treatments are properly available. In K.R. Pet taluk proper treatment has been available to people according to only 35 percent of the respondents. Therefore, there is significant change in availability of proper treatment based on taluk. Accordingly, availability of proper treatments are relatively and significantly more in Mandya and Pandavapura taluk compared to K.R. Pet taluk.

20 percent of people in Mandya, 87 percent of people in Pandavapura and 75 percent of people in K.R. Pet have utilized Yashaswini scheme in Mandya
district. Therefore, there is significant change in utilization of scheme based on taluk. Accordingly, utilization of scheme is relatively and significantly more in Pandavapura and K.R. Pet taluks compared to Mandya taluk.

- 76 percent of people in Mandya, 73 percent people in Pandavapura and 67 percent of people in K.R. Pet have satisfaction on government schemes. Therefore, there is no significant change in level of satisfaction in Mandya district based on taluk. Hence, region has not made significant impact on level of satisfaction about government schemes in Mandya district.

- 8 percent of people in Mandya, 17 percent of people in Pandavapura and 59 percent of people in K.R. Pet have been suffered from malnutrition. It has been proved by chi-square test that there is significant association between malnutrition and taluk. Therefore, there is significant change in malnutrition status in Mandya district based on taluk. Accordingly, problem of malnutrition is significantly high in K.R. Pet taluk compared to Pandavapura and Mandya taluk.

- Nutritional level of people in K.R. Pet taluk is significantly low, nutritional level of people in Pandavapura taluk is significantly moderate and nutritional level of people in Mandya taluk is significantly high.

- Most of the people have not been utilized insurance facilities the study area.

- Madilu and Janani Suraksha schemes have been effectively implemented in Mandya district.

- Availability of laboratories is relatively more in Mandya taluk compared to Pandavapura and K.R. Pet taluk.

- Availability of lady doctors are relatively more in Mandya and Pandavapura taluk compared to K.R. Pet taluk.

- Level of satisfaction about healthcare services provided by public healthcare institutions is relatively high in Mandya and Pandavapura taluks compared to K.R. Pet taluk.
Conclusion

The present Study analyzed the availability, accessibility and utilization of healthcare services provided by public healthcare institutions. It has been identified by the survey and analysis that availability and accessibility healthcare services are relatively high in Mandya taluk compared to Pandavapura and K.R. Pet taluks.. Significant differences have not found among selected taluks in terms of utilization of public healthcare provisions. Therefore, it can be summarized that health security is relatively high in Mandya taluk, moderate in Pandavapura taluk and low in K.R. Pet taluk. Hence, there is need to give more priority to K.R. Pet taluk within the Mandya district in creating and providing healthcare infrastructure and services.

Hypotheses Testing:

Hypothesis No. 1

H0: Resource allocations have not made positive impact on development of public healthcare institutions.

H1: Resource allocations have made positive impact on development of public healthcare institutions.

Model: the following model used to estimate the impact of PCGSDP, revenue expenditure and capital expenditure on hospitals.

\[
\ln\text{Hospitals} = \alpha + \beta_1 \ln\text{PCGSDP} + \beta_2 \ln\text{REH} + \beta_3 \ln\text{CEH} + e
\]

Where;

\(\ln\text{Hospitals}\) = Log of hospitals in Karnataka
\(\ln\text{PCGSDP}\) = log of per capita gross state domestic product
\(\ln\text{REH}\) = log of revenue expenditure on healthcare
\(\ln\text{CEH}\) = log of capital expenditure health care.

\(\beta\)'s = Elasticity coefficients for independent variables
\(\alpha\) = Constant of the model, expressed in terms of log
\(e\) = Error term for the model

\[\hat{\ln}\text{Hospitals} = -10.11 + 0.92 \ln\text{PCGSDP} + 0.69 \ln\text{REH} + 0.13 \ln\text{CEH} + e\]

t-value: (-5.4355) (4.591) (2.441) (2.542) 
P-value: 0.000 0.001 0.035 0.029

\(R^2 = 0.968, \text{Adjusted } R^2 = 0.959, F = 102.846, \text{ P-value: 0.000, and DW: 1.784} \]
It has been found from the above result that the model is highly good fitted with R-squared and adjusted R-squared value. Since the DW test values are around 2 and above the R-squared value, there are no autocorrelation problems. Hence, the results are not spurious. Accordingly the model, explained variance in the model and results are reliable and acceptable. The constant value is negative and significant at one percent level. Means, if there is no contribution from the independent variables, there will be negative change in number of hospitals. The F - value is highly significant. Therefore, the total variability of hospitals has been significantly explained by independent variables. The t-value explains individual impact of each independent variable on dependent variable. It has been found from the elasticity coefficients that there is positive elasticity between PCGSDP and hospitals; and this is significant at one percent level. Accordingly, increase in PCGSDP has been significantly and positively influenced the number of hospital. There is relatively positive elasticity between revenue expenditure on health sector and hospitals; and this is significant at five percent level. There is relatively positive elasticity between capital expenditure on health sector and hospitals; and this is significant at five percent level.

Accordingly, the null hypothesis is rejected and alternative hypothesis is accepted. Therefore, resource allocations have made positive impact on development of public healthcare institutions.

Hypothesis No. 2

H0: There is no positive relationship between economic development and human healthcare infrastructure.

H1: There is positive relationship between economic development and human healthcare infrastructure.

**Model:** the following model used to estimate the impact of PCGSDP, revenue expenditure and capital expenditure on number of doctors in hospitals of Karnataka.
\[ \ln DOC = \alpha + \beta_1 \ln PCGSDP + \beta_2 \ln REH + \beta_3 \ln CEH + e \]

Where;

- \( \ln DOC \) = Log of doctors in Karnataka
- \( \ln PCGSDP \) = log of per capita gross state domestic product
- \( \ln REH \) = log of revenue expenditure on healthcare
- \( \ln CEH \) = log of capital expenditure health care.
- \( \beta \)'s = Elasticity coefficients for independent variables
- \( \alpha \) = Constant of the model, expressed in terms of log
- \( e \) = Error term for the model

\[^{\ln DOC} = -2.797 + 1.21 \ln PCGSDP - 0.11 \ln REH - 0.03 \ln CEH\]

<table>
<thead>
<tr>
<th>t-value</th>
<th>P-value</th>
<th>t-value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-3.865)</td>
<td>0.003</td>
<td>(15.437)</td>
<td>0.000</td>
</tr>
<tr>
<td>(-1.020)</td>
<td>0.332</td>
<td>(-1.807)</td>
<td>0.101</td>
</tr>
</tbody>
</table>

\( R^2 = 0.989 \), Adjusted \( R^2 = 0.986 \), \( F = 312 \), P-value: 0.000, and DW: 2.661

It has been found from the above result that the model is highly good fitted with high R-squared and adjusted R-squared value. Since the DW test values are near to two and above the R-squared value, there are no autocorrelation problems. Hence, the results are not spurious. Accordingly the model, explained variance in the model and results are reliable and acceptable. The constant value is negative and significant at five percent level. Means, if there is no contribution from the independent variables, then there will be negative change in number of doctors. It means, though the numbers of doctors have not been wholly depending on the independent variables incorporated in the above model, number of doctors will be decreased. The F - value is significant. Therefore, the total variability number of doctors has been significantly explained by independent variables. The t-value explains individual impact of each independent variable on dependent variable. It has been found from the elasticity coefficients that there is positive elasticity between PCGSDP and number of doctors in Karnataka; and this is significant at one percent level. Accordingly, increase in PCGSDP has been significantly influenced the number of doctors in Karnataka. There is relatively negative elasticity between revenue expenditure on health sector and doctors in hospitals of Karnataka; but this is not significant even at ten percent level. There is relatively negative elasticity between capital expenditure on health sector and doctors in hospitals of Karnataka; but this is also not significant even at ten percent level.
Therefore, revenue and capital expenditure on healthcare have not been significantly influenced the number of doctors in Karnataka. Accordingly, the increase in number of doctors in hospitals of Karnataka has not been significantly depending upon revenue and capital expenditure on healthcare. However, PCGSDP has been significantly influenced number of doctors in Karnataka. And, the rate of change in number of doctors in hospitals of Karnataka due to change in PCGSDP is also relatively high. Hence, the growth of doctors in hospitals of Karnataka depends on the growth of the economy and not the allocation of revenue and capital expenditure.

**Accordingly, the null hypothesis is rejected and alternative hypothesis is accepted. Therefore, there is positive relationship between economic development and human healthcare infrastructure.**

**Hypothesis No. 3**

H0: There is no regional disparity in availability of healthcare infrastructures.

H1: There is regional disparity in availability of healthcare infrastructures.

The following dummy variable model has constructed to analyze the disparity in number of people per hospital.

The Model;

\[ NPH = \alpha + \beta_1 D_1 + \beta_2 D_2 + \beta_3 D_3 + e \]

Where;

- \( NPH = \) Number of people per hospital
- \( \alpha = \) Average value for benchmark (i.e., for Mysore)
- \( \beta = \) Difference between dummy and benchmark
- \( D_1 = \) Dummy for Bangalore
- \( D_2 = \) Dummy for Belgaum
- \( D_3 = \) Dummy for Gulbarga

N-1 dummies used in order to avoid dummy variable trap.

\[ \hat{NPH} = \alpha + \beta_1 D_1 + \beta_2 D_2 + \beta_3 D_3 + e \]

<table>
<thead>
<tr>
<th>t-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(10.219)</td>
<td>0.000</td>
</tr>
<tr>
<td>(2.045)</td>
<td>0.051</td>
</tr>
<tr>
<td>(4.421)</td>
<td>0.000</td>
</tr>
<tr>
<td>(4.521)</td>
<td>0.000</td>
</tr>
</tbody>
</table>
The dummy variable regression ANOVA model presents information about difference in availability of hospital facility. The constant is significant at one percent level. In the present model constant represents the benchmark and benchmark in this case is Mysore.

In Mysore, there is a hospital for every 3260 people. The difference in availability of hospital between Mysore division and Bangalore division is 923 persons but this difference is not significant at five percent level.

The difference in availability of hospital between Mysore division and Belgaum division is 2067 persons and this difference is significant at one percent level. The difference in availability of hospital between Mysore division and Gulbarga division is 2203 persons and this difference is significant at one percent level.

Therefore, there is no significant difference between Mysore and Bangalore division in availability of hospitals. There is significant difference between Mysore and Belgaum division in availability of hospitals. At the same time, there is significant difference between Mysore and Gulbarga division in availability of hospitals.

Accordingly, availability of healthcare infrastructures in Belgaum and Gulbarga division is significantly low compared to Bangalore and Mysore divisions. Hence, the null hypothesis is rejected and the alternative hypothesis is accepted.

Hypothesis No. 4

H0: Access the hospital does not play significant depends on the distance

H1: Access the hospitals plays significant depend on the distance.

Distance to Hospitals in Mandya District (In Numbers and Percentage)

<table>
<thead>
<tr>
<th>Distance to Hospitals</th>
<th>Taluks</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mandya</td>
<td>Pandavapura</td>
</tr>
<tr>
<td>Near</td>
<td>Count</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>% within Taluks</td>
<td>53.3%</td>
</tr>
<tr>
<td>Far</td>
<td>Count</td>
<td>70</td>
</tr>
</tbody>
</table>
Distance from home to hospital has presented in the above table. Accordingly, 53 percent of people in Mandya, 67 of percent people in Pandavapura and 25 percent of people in K.R. Pet have hospital near to their homes. At the same time, 47 percent of people in Mandya, 33 percent in Pandavapura and 75 percent of people in K.R. Pet have hospital far from their homes. It has been proved by chi-square test that there is significant association between distance to hospitals and taluk. Therefore, there is significant change in distance to hospital based on taluk. Accordingly, in Mandya and Pandavapura taluks majority of the people have hospitals near to their homes, in K.R. Pet taluk majority of the people do not have hospitals near to their homes. Hence, region has significant impact on distance to hospitals.

*Therefore, the null hypothesis is rejected and alternative hypothesis is accepted and Access the hospitals play significant in depend on distance.*

**Hypothesis No. 5**

H0: There is no significant difference in availability of doctors.

H1: There is significant difference in availability of doctors.

### Availability of Doctors in Hospitals in Mandya District  
*(In Numbers and Percentage)*

<table>
<thead>
<tr>
<th>Availability of Doctors</th>
<th>Taluks</th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mandya</td>
<td>Pandavapura</td>
<td>K.R. Pet</td>
<td></td>
</tr>
<tr>
<td>Only One</td>
<td>Count</td>
<td>5</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>% within Taluks</td>
<td>3.3%</td>
<td>7.3%</td>
<td>7.3%</td>
</tr>
<tr>
<td>Only Two</td>
<td>Count</td>
<td>12</td>
<td>80</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>% within Taluks</td>
<td>8.0%</td>
<td>53.3%</td>
<td>52.7%</td>
</tr>
<tr>
<td>More than 2</td>
<td>Count</td>
<td>133</td>
<td>59</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>% within Taluks</td>
<td>88.7%</td>
<td>39.3%</td>
<td>40.0%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
</tbody>
</table>
### % within Taluks

<table>
<thead>
<tr>
<th></th>
<th>100.0%</th>
<th>100.0%</th>
<th>100.0%</th>
<th>100.0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square Value: 98.846</td>
<td>Degrees of Freedom: 04</td>
<td>Sig: 0.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Field survey data, computed by researcher.

Availability of doctors in hospitals has presented in the above table and graph. According to 3 percent of people in Mandya, 7 percent of people in Pandavapura and 7 percent of people in K.R. Pet there was only one doctor in hospitals. According to 8 percent of people in Mandya, 53 percent of people in Pandavapura and 53 percent of people in K.R. Pet there were only two doctors in hospitals. According to 89 percent of people in Mandya, 39 percent of people in Pandavapura and 40 percent of people in K.R. Pet there were more than two doctors in hospitals. It has been proved by chi-square test that there is significant association between number of doctors in hospitals and taluk. Therefore, there is significant change in availability of doctors in hospital based on taluk.

Accordingly, **availability of doctors is relatively and significantly more in Mandya taluk compared to Pandavapura and K.R. Pet taluk. Hence the null hypothesis is rejected and alternative hypothesis is accepted.**
Policy Imperatives:

Health sector in Karnataka has been positively grown in terms of resource allocation, institutional provisions, infrastructure development and service delivery. However, there are always scope for improvement and expansion. Therefore, based on the present study the following policy imperatives are made:

- It has been identified from the study that capital expenditure has made significant influence on hospitals in general but failed to influence the PHCs. Therefore, there is need for more capital allocation for PHCs to reach the rural people.
- Revenue expenditure has been succeeded to increase the number of hospital beds at Karnataka level and failed to significantly provide services at PHCs’ level. Therefore, there is need for more revenue allocation for PHCs to provide better health care services.
- Both revenue and capital expenditures are insufficient in Karnataka to influence the growth of doctors. Moreover, growth of number of doctors has been associated with the growth of the economy and role of the government to increase the number of doctors in hospital has been found negligible. Accordingly, there is need for sufficient government allocation to healthcare services to improve the quantity and quality of healthcare services.
- The study identified significant regional disparities in institutional provision of healthcare services. Therefore, there is a need to allocate more resources to Belgaum and Gulbarga region to increase and improve the healthcare services in these regions.
- The primary data analysis has proved that availability of hospitals are more in urban and nearby urban places and not sufficiently available in rural areas. Therefore, there is a need to allocate more financial resources to increase and improve healthcare infrastructure at rural areas.
- It has been also proved by primary data analysis that doctors are available only at urban places and not sufficiently available in nearby urban and rural areas. Therefore, there is a need increase number of doctors at rural areas.
- Malnutrition and poor nutritional status of rural people is one of the characteristics of rural people and needs specific programmes to increase the nutritional status of rural people in general and rural poor in particular.
Accordingly, nutritional components may be included in the baskets of rural public distribution system.

**Conclusion:**

The present study examined the institutional provision of healthcare services in Karnataka. Karnataka has achieved significant growth in regard to important parameters of healthcare sector. The resource allocations for healthcare sector by government of Karnataka have been also increased. However, there is further need of more resource allocation to increase and improve the quantity and quality of healthcare services in Karnataka. At the same time, there is a need to reduce regional disparities within Karnataka and within the regions. There are significant differences in provision of healthcare services between South and North Karnataka as well as between urban and rural places. Therefore, priority should be given to North Karnataka and that to rural places. The awareness has to be given to people for better utilization of healthcare provisions, programmes and schemes. To conclude, there is always scope for improvement, enhancement, in healthcare sector in Karnataka. There is wide scope for future research on various issues like, public-private partnership, cooperative healthcare provisions, health tourism, public, social, community, and private expenditures on health, returns to investment on health, resources use efficiency analysis, urban and rural gap, gender issues, evaluation of specific policy or programmes and many more.