Inter-District Variations in Education and Health Care in Kerala: A Review in the Context of Inclusive Growth

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Abstract: *Among a number of factors which are influencing the economic development of a nation, the social factors like education and health care have prime significance. While the policy makers put inclusive growth as an objective, this study will be helpful for them to assess the current situation of education and health care in Kerala. The study analyses the major determinants of education and health care extracting from recent Economic Reviews, SRS Bulletins and Census of India 2011-Provisional population totals. The study employed Pearson correlation coefficient to test the relationship between Education (A) and Health (B), Per Capita Income (PCI) and Education (A), Per Capita Income (PCI) and Health (B), Per Capita Income (PCI) with both Education and Health (A&B). And the coefficient of Variation to test the extent of variability in education and health care sector. The correlation values are (i) A and B (0.568), (ii) PCI and A (0.397), (iii) PCI and B (0.145), and (iv) PCI and A&B (0.257). All are positively correlated. The value of Coefficient of Variation is $CV_A = 15.64$ and $CV_B = 29.01$. The study reveals that the inter-district variation in health care (B) (29.01%) is more than that of education (A) (15.64%).The composite index of social development (A and B) shows that Malappuram district scores the last rank in social development in the State with the composite index 0.709 and Palakkad district scores the 13th rank with an index 0.826. Out of the 11 indicators considered in a per lakh population basis, Malappuram district ranks only four last ranks with zero first or second ranks. Therefore on the basis of the indicators considered, it may be concluded that Malappuram district is still in the last position in social development.*

Key Words: *Couple Protection Rate, Correlation, Coefficient of Variation, Composite Index, Per Capita Income, Social development*

I.   Introduction

Many factors are considered as the development indicators of a nation, such as Agriculture, Industry, services like Education, health care etc. The development of these sectors will provide higher per capita State Domestic Product and further higher per capita State Domestic Income. But education and health are the two interrelated qualitative factors come under the service sector and they are the integral part of the social development of a nation. Education and health status of population is the positive sign of socio-economic and human development of a nation. Education is a medium through which knowledge is imparted from one generation to another. It leads to further learning and research. Education is an instrument which provides the means of living to the people. And hence it will provide the income and wealth to people. Education acts as a means of income and wealth and it will be supported to overcome the ill-health or malnutrition. When considering the inclusive growth in the entire field, it is necessary to eliminate the inter-district variations in education and health care if it is prevailing.

Objectives of the Study
1. To identify the inter-district variations in education and health care (two important social development indicators).
2. To examine the position of Malappuram district in education and health care sector.
3. To find out the association of Per Capita Income with education and health care in Kerala

Significance of the Study
The government projects and financial assistance should be to those they are deserved in the context of inclusive growth. In order to understand the deserving groups and the area, we have to analyze the development indicators in a region wise. In this context this study has special significance.

Methodology
This paper is based on secondary data, which has compiled from Census of India 2011: Provisional Population totals, Economic Review 2011, Economic Review 2010, Economic Review 2009 and SRS Bulletins, and the collected data has been classified and analyzed in a systematic manner. For analysis, the statistical tools

like Ratios, percentages, Averages, Index Numbers, Standard Deviation, Co-efficient of Variation and Correlation are used

II.   Education

The role of education in economic growth and their inter-relationships are increasingly focused by public debates since the era of Plato. Investment in education leads to the formation of human capital, comparable to physical capital and social capital, and that makes a significant contribution to economic growth.

The major contribution to the issue on the relationship between education and economic growth was first made by Adam Smith, followed by Marshall, Schultz, Bowman, Hicks and others.

S.C.Goel (1974) investigated the relationship between the level of educational and economic development in India during the period 1950-51 to 1970-71. His study shows that, there was very significant correlation between education and per capita income.

The district wise population and per capita income data of Kerala is necessary for making a comparative study of education and health indicators out of per lakh population basis.

TABLE 1: Ranking of Districts by Population size and Per Capita Income

Districts	Population	Ranks in 2011	Per Capita Income (Q)	Ranks
Thiruvananthapuram (TPM)	33,07,284	2	57563	3
Kollam (KLM)	26,29,703	7	48795	11
Pathanamthitta (PTA)	11,95,537	12	56994	4
Alapuzha(ALP)	21,21,943	9	53535	6
Kottayam(KTM)	19,79,384	10	61668	2
Idukki(IDK)	11,07,453	13	51367	7
Eranakulam(EKM)	32,79,860	3	79553	1
Thrissur(TSR)	31,10,327	4	56087	5
Palakkad(PKD)	28,10,892	6	49825	10
Malappuram(MPM)	41,10,956	1	33783	14
Kozhikkode(KKD)	30,89,543	5	50389	9
Wayanad(WYD)	8,16,558	14	38341	13
Kannur(KNR)	25,25,637	8	50623	8
Kasaragod(KSD)	13,02,600	11	44588	12
State	3,33,87,677	---	52984	---

Source: Census of India 2011 provisional population Totals, Economic Review 2010 (Q:Quick)
Note: Per Capita Income data are District-wise Per Capita Income at constant (1999-2000) Prices

Education improves the earning capacity of people providing wider occupation and choice and encourages healthy habits. Better health further provides better education. Therefore education and health are considered as the two sides of coin. The important education indicators used in the study are 1. Literacy rate, 2. Couple Protection rate, 3. Distribution of Schools per lakh population, 4. Number of Arts and Science Colleges per lakh population.

TABLE 2: **Ranking of Districts by Literacy Rate and Couple Protection Rate**

Districts	Literacy rate (Persons)	**Index1**	Rank	Couple protection rate	**Index 2**	Rank
TPM	92.66	0.986	10	42.26	0.9401	10
KLM	93.77	0.998	8	39.97	0.8892	11
PTA	96.93	1.032	1	43.43	0.9661	8
ALP	96.26	1.025	3	38.67	0.8602	13
KTM	96.40	1.026	2	57.09	1.2700	2
IDK	92.20	0.981	11	61.54	1.3690	1
EKM	95.68	1.018	4	51.19	1.1388	5
TSR	95.32	1.015	6	51.04	1.1354	6
PKD	88.49	0.942	14	56.37	1.2540	4
MPM	93.55	0.996	9	31.13	0.6925	14
KKD	95.24	1.014	7	39.24	0.8729	12
WYD	89.32	0.951	13	56.52	1.2573	3
KNR	95.41	1.016	5	45.08	1.0028	7
KSD	89.85	0.956	12	42.46	0.9446	9
Kerala	93.91	1	---	44.95	1	---

Source: Computed from Census of India 2011: Provisional Population Totals and Economic Review 2010

In the literacy rate, Pathanamthitta district has the first rank while it has the 4th rank in Per capita income. Eranakulam District is the first rank holder in Per capita income has the 4th rank in Literacy rate.

Malappuram district has got 9th rank in literacy rate while it has last rank in per capita income. Palakkad district is in the 14th rank in literacy rate while it has 10th rank in Per capita income.

Couple Protection rate may be considered as the result of better education. At the same time it is a good health habit. The awareness of people about the family planning methods are more in those they are more educated. Therefore, higher the couple protection rate means higher the level of education and it will be supported for further economic development.

In Couple Protection rate Idukky district has the first rank with 7th rank in Per capita Income. Kottayam and Wayand districts have got second and third ranks respectively. Malappuram district is in the 14th rank both in per capita income and couple protection rate.

An inclusive and balanced distribution of schools is necessary for the balanced development in the field of education. District wise distribution of schools per lakh of population indicates the existence of inter district variations in the access of school education.

TABLE 3: **Ranking of districts by Number of Schools (G+PA+PUA) and Arts and Science Colleges (G &PA) per lakh of Population**

Districts	Total schools/lakh population	**Index3**	Rank	Colleges/lakh population	**Index4**	Rank
TPM	29.96	0.79	14	0.60	1.05	8
KLM	35.65	0.94	10	0.50	0.87	9
PTA	61.58	1.62	1	0.81	1.42	2
ALP	36.33	0.96	8	0.61	1.07	7
KTM	47.90	1.26	3	1.15	2.01	1
IDK	43.18	1.14	4	0.72	1.26	4
EKM	31.59	0.83	13	0.65	1.14	5
TSR	32.50	0.86	12	0.64	1.12	6
PKD	33.10	0.87	11	0.46	0.80	10
MPM	35.90	0.95	9	0.26	0.45	14
KKD	41.20	1.08	6	0.45	0.78	11
WYD	36.50	0.97	7	0.75	1.31	3
KNR	51.72	1.36	2	0.44	0.77	12
KSD	42.55	1.12	5	0.38	0.66	13
Kerala	37.87	1	--	0.57	1	--

Source: Computed from Economic Review 2011

Note: G=Government, PA=Private aided, PUA=Private unaided

The index of number of schools per lakh of population indicates that Pathanamthitta district has got the first rank whereas Malappuram district bags the 9th rank and Thiruvananthapuram district has got the 14th rank with an index 0.79.

The number of Arts and Science Colleges is an indicator of the development in the higher education sector. While speaking the inclusive and balanced development in the field of higher education, the number of government and government aided arts and science colleges may be considered as a criterion. The index shows that there are higher inter-district variations in the access of arts and science colleges in government and government aided sector.

In the provision of Arts and Science colleges in Government and Private Aided sector, Kottayam district has 1.51 arts and science colleges per lakh population and bags the first rank. Malappuram district has only 0.26 colleges per lakh population and bags the last rank.

III.   Health Care

Health care indicators represent the development of medical care infrastructure in the public and private sector. But here only the public health care indicators are considered for analyzing the inter-district variations. The important health care indicators used in these analyses are

1. Number of Hospitals per lakh population. 2. Number of Hospital beds per lakh population. 3. Number of Ayurveda and Homeo Hospitals per lakh population. 4. Number of hospital beds (Ayurveda and Homeo) per lakh population and 5. Number of Water Supply schemes per lakh population.

TABLE 4: **Ranking of Districts by Number of Allopathy Hospitals (GH, DH, PHC, CHC, SH, TBC &TH) and Hospital beds**

Districts	Hospitals/lakh population	Index1	Rank	Hospital beds/lakh population	Index 2	Rank
TPM	3.48	0.92	10	147.06	1.32	3
KLM	3.26	0.86	12	89.30	0.80	11
PTA	5.37	1.43	2	162.51	1.46	1
ALP	4.09	1.09	7	154.90	1.39	2
KTM	4.26	1.13	5	127.53	1.15	7
IDK	5.63	1.50	1	113.18	1.02	8
EKM	3.59	0.95	9	138.82	1.25	5
TSR	3.80	0.90	11	145.77	1.31	4
PKD	4.00	1.06	8	84.82	0.764	12
MPM	2.92	0.77	14	90.36	0.81	10
KKD	2.98	0.79	13	55.81	0.50	14
WYD	5.25	1.40	3	136.76	1.23	6
KNR	4.2	1.12	6	111.68	1.007	9
KSD	4.38	1.16	4	84.53	0.762	13
Kerala	3.75	1	--	110.88	1	--

Source: Computed from Economic Review 2010

Note: GH=Govt. Hospitals, DH=District Hospitals, PHC=Primary Health Centres, CHC= Community Health Centres, SH=Speciality Hospitals, TBC= TB Centres, TH=Taluk Hospitals.

The ranking of districts on the basis of the index of number of hospitals per lakh of population including (GH, DH, PHC, SH, TBC and TH) shows that Malappuram district has the 14th rank with an index 0.77 against the first, second and the third ranks with an index 1.5 for Idukky district, 1.43 for Pathanamthitta district and 1.4 for Wayanad district respectively.

Ranking of districts in number of Allopathy hospital beds per lakh population, Kozhikkode district has the 14th rank with an index 0.50. Malappuram district bags the 10th rank with an index 0.81. Pathanamthitta and Alapuzha districts have got the 1st and 2nd rank with the index 1.46 and 1.39 respectively.

TABLE 5: **Ranking of districts by number of Homeo and Ayurveda Hospitals**

Districts	Homeo Hospitals/ lakh population	Index3	Rank	Ayurveda Hospitals/lakh population	Index4	Rank
TPM	0.121	1.36	5	0.42	1.2	4
KLM	0.114	1.28	6	0.34	0.97	9
PTA	0	0	14	0.41	1.17	5
ALP	0.141	1.58	4	0.47	1.34	2
KTM	0.151	1.70	3	0.45	1.28	3
IDK	0.180	2.02	2	0.27	0.77	10
EKM	0.091	1.02	9	0.40	1.14	6
TSR	0.032	0.36	13	0.51	1.46	1
PKD	0.035	0.39	12	0.21	0.6	14
MPM	0.048	0.54	10	0.26	0.74	11
KKD	0.097	1.09	8	0.23	0.66	13
WYD	0.122	1.26	7	0.36	1.02	8
KNR	0.039	0.43	11	0.24	0.68	12
KSD	0.23	2.58	1	0.38	1.08	7
Kerala	0.089	1		0.35	1	

Source: Computed from Economic Review 2011 and 2010

The district wise distribution of number of Homeopathy Hospitals per lakh population shows that Pathanamthitta district has no Homeopathy Hospital and therefore it has the 14th rank with an index zero. Malappuram district has 10th rank with an index 0.54 while Kasaragod and Idukky districts have got 1st and 2nd ranks with the index 2.58 and 2.02 respectively.

In the case of number of Ayurveda Hospitals per lakh population shows that Malappuram district has 11th rank with an index 0.74. Thrissur district is in the first rank with an index1.46 and Alapuzha district is in the second rank with an index 1.34.

The district wise analysis of number of hospital beds per lakh population under Homeopathy hospitals shows that Pathanamthitta district is in the 14th rank due to lack of homeopathy hospitals. Malappuram district has 10th rank in providing hospital beds under homeopathy medical system with an index 0.44. Kottayam and Kasaragod bag first and second ranks respectively.

TABLE 6: **Ranking of districts by number of Hospital beds (Homeo & Ayurveda)**

Districts	Beds/Lakh Population (Homeo)	Index5	Rank	Beds/lakh population (Ayurveda)	Index6	Rank
TPM	5.59	2.055	3	8.62	1.04	5
KLM	2.85	1.05	7	7.22	0.87	11
PTA	0	0	14	12.55	1.51	3
ALP	3.53	1.29	5	8.48	1.02	8
KTM	7.58	3.34	1	8.08	0.97	9
IDK	4.52	1.66	4	14.45	1.74	2
EKM	2.28	0.83	9	8.53	1.03	7
TSR	0.80	0.29	13	9.42	1.14	4
PKD	0.89	0.33	12	5.33	0.64	14
MPM	1.2	0.44	10	5.35	0.65	13
KKD	2.42	0.89	8	6.79	0.82	12
WYD	3.06	1.12	6	20.8	2.51	1
KNR	0.99	0.36	11	8.55	1.033	6
KSD	5.76	2.12	2	7.68	0.92	10
Kerala	2.72	1		8.27	1	

Source: Computed from Economic Review 2011 and 2010

In the case of number of hospital beds under Ayurveda medical system, Palakkad district is in the 14th rank with an index 0.64. Malappuram district is on the 13th rank with an index 0.65 while Wayanad and Idukky districts hold the 1st and 2nd rank respectively.

TABLE 7**: Ranking of districts by Category-wise Water Supply Schemes- KWA**

Districts	Water supply Schemes/lakh population	Index7	Rank
TVM	4.29	0.66	11
KLM	3.99	0.62	12
PTA	6.02	0.93	9
ALP	4.00	0.61	13
KTM	7.93	1.22	5
IDK	17.70	2.73	1
EKM	4.97	0.76	10
TSR	8.39	1.29	3
PKD	6.65	1.02	8
MPM	3.77	0.58	14
KKD	8.02	1.23	4
WYD	7.59	1.17	6
KNR	6.97	1.07	7
KSD	11.75	1.81	2
Kerala	6.47	1	

Source: Computed from Economic Review 2011

One of the most important determinants of health of people is the availability of clean drinking water. The district-wise water supply schemes per lakh population shows that Malappuram district is in the 14th rank with an index 0.58, Idukky and Kasaragod bags 1st and 2nd ranks respectively.

Composite Index of Education and Health Care Indicators

The composite index of indicators of education reveals the fact that Malappuram District has the 14th rank with an index 0.77 and may be labelled as the most backward district in Kerala in the provision and utilization of educational facilities. This is depicted in the table below.

TABLE 8: **Composite index of Education (A) and Health Care (B) Indicators**

Districts	Composite Index (A)	Composite Rank (A)	Composite Index (B)	Composite Rank (B)
TVM	0.941539	10	1.222	5
KLM	0.924303	12	0.921	10
PTA	1.259546	2	0.928	9
ALP	0.978822	8	1.188	6
KTM	1.39152	1	1.541	2
IDK	1.187519	3	1.634	1
EKM	1.031705	7	0.997	7
TSR	1.032621	6	0.964	8
PKD	0.966515	9	0.686	13
MPM	**0.772137**	**14**	**0.647**	**14**

KKD	0.936743	11	0.854	11
WYD	1.122099	4	1.314	4
KNR	1.037223	5	0.75	12
KSD	0.920151	13	1.364	3
Kerala	1	--	1	--

Source: Compiled from secondary data

Composite index of health care sector also reveals that Malappuram district is highly backward. Malappuram ranks 14th position in the provision of health care facilities. The composite index of health care of Malappuram district is only 0.647 against 1.634 for Idukky and 1.541 for Kottayam.

Composite Index of Social Development
The composite index of social development (education and health) of each district is worked out through simple indices method.

TABLE 9: **Composite Social Development indices for districts in Kerala (Simple indices method)**

Districts	A	B	Composite Social Development Index (A&B)	Rank
TVM	0.941539	1.222	1.081	7
KLM	0.924303	0.921	0.922	10
PTA	1.259546	0.928	1.093	5
ALP	0.978822	1.188	1.083	6
KTM	1.39152	1.541	1.466	1
IDK	1.187519	1.634	1.410	2
EKM	1.031705	0.997	1.014	8
TSR	1.032621	0.964	0.998	9
PKD	0.966515	0.686	0.826	13
MPM	**0.772137**	**0.647**	**0.709**	**14**
KKD	0.936743	0.854	0.895	11
WYD	1.122099	1.314	1.218	3
KNR	1.037223	0.75	0.893	12
KSD	0.920151	1.364	1.142	4
Kerala	1	1	1	

Source: Compiled from Secondary Data. (A=Education, B=Health Care)

Considering the composite index of social development (education and health care), Malappuram district is the most backward district in the State. The differences in the values of composite indices of the districts show that there is an existence of inter-district variations in the social development.
Out of the 11 indicators listed, 4 last ranks are recorded by Malappuram District. It is noted that Malappuram district has got no places in the list of first and second ranks. These illustrations consistently establish the fact that Malappuram is the least socially developed district in Kerala.

TABLE10: **Statistical Estimation of Coefficient of Variation**

Sectors	Mean	Standard Deviation	Coefficient of Variation
A	1.0431	0.1632	15.64
B	1.0721	0.3110	29.01

A= Education,   B= Health Care

The coefficient of Variation is more in the Health Care sector. Therefore it is clear that there is high degree of variations in Health care sector than that of Education sector.

TABLE 11: **The Pearson Correlation coefficient**

Sector	Education (A)	Health (B)	A &B	PCI
Education(A)	1	0.568	---	0.397
Health(B)	0.565	1	---	0.145
A &B	---	---	1	0.257
PCI	0.397	0.145	0.257	1

The correlation coefficients between education and health, education and per capita income, health and per capita income, both education-health and per capita income are positive. Malappuram district has score the last rank in per capita income, education and health care.

IV.   Conclusion

This study considered 11 indicators for measuring the inter-district variations in Education and Health Care. There is a positive association between the level of Per Capita Income and education and health. The coefficient of Variation shows that the variations in Health Care are more than the variations in education. Out of the 11 indicators considered, Malappuram district scores four last ranks with no first or second ranks. Therefore it is clear that Malappuram district is more socially backward district or scores the last (Fourteenth) rank. Palakkad district scores the thirteenth rank in the composite index of both education and health care. Since Malappuram district is a highly populated district, the provision of education and health care services should be on the basis of population proportion. Therefore a special attention from the side of authorities is necessary to provide a balanced and inclusive growth in the field of education and health.

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