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Determinants Of Health care in Tamilnadu:An Econometric Analysis.

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Introduction:

The classical view of the relationship between health and economic development is that wealth leads to health, with health an output of the development process. Better health itself contributes to economic growth. Bloom and Canning (2003) and Gyimah – Brempong and Wilson (2004) found that health capital indicators positively influence aggregate output. Improved health contributes to economic growth in four ways: it reduces production loses caused by worker illness; it permits the use of natural resources that had been totally or nearly inaccessible because of disease; it increase the enrollment of children in school and increases their learning and it frees resources for alternative uses that would otherwise have to be spent on treating illness. With increased urbanization, industrialization and the changing environment, health related issues and problems are being emphasized and have become a great concern for the contemporary world.

Millennium Health Development Goals:

The United Nations Development Project (UNDP) has brought out the Human Development Report, 2003 with focus on Millennium Development Goals (MDGs) set for 2015 and presented an Action Plan for reaching the goals. The goals relating to health sector are as follows:

- Reduce infant and child mortality rates by two-thirds between 1990 and 2015.
- Reduce maternal mortality rates by three-quarters between 1990 and 2015.
- Provide access for all who need reproductive health service by 2015.
- Control the spread of HIV/AIDS and halt it by 2015; and
- Check the incidence of Malaria and other major diseases and halt it by 2015.

Assessment of Human Development Parameters: Five performance indicators to measure health systems are:

- The overall level of health of the population; Health inequalities within the population;
- Health-system responsiveness (a combination of patient satisfaction and system performance); The distribution of responsiveness within the population (how well people of varying economic status find that they are served by the health system); and
- The distribution, or fairness, of the health system's financial burden within the population.

The Millennium Development Goals, Targets and Indicators Related to Women's Health

In 2000, the Millennium Declaration set eight global Millennium Development Goals (MDGs) that provide a framework for confronting poverty, hunger and environmental problems challenging poor countries to improve health, education and gender equity.[1]

Women's health is not only linked to the health-related MDGs, it is also dependent on access to nutrition, education and employment opportunities, and women's status in society.

The Millennium Development Goals, Targets and Indicators Related to Women's Health
Goal 1 – Achieve Universal Primary Education
Target: **Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling** Indicators ▪ Net enrollment in primary education ▪ Primary Completion Rate (total and by sex) ▪ Literacy rate of young people aged 15–24 years (total and by sex)

Goal 2 – Promote Gender Equality and Empower Women

Target:

Eliminate gender disparity in primary and secondary education preferably by 2005, and at all levels by 2015

Indicators

- Ratios of girls to boys in primary, secondary and tertiary education
- Share of women in wage employment in the non-agricultural sector
- Proportion of seats held by women in national parliament

Goal 3 – Improve Maternal Health

Target:

Reduce by three quarters the maternal mortality ratio

Indicators

- Maternal mortality ratio (maternal deaths per 1000 live births)
- Proportion of births attended by skilled health personnel

Target:

Achieve, by 2015, universal access to reproductive health

Indicators

- Contraceptive prevalence rate (percentage using contraception among women aged 15–49 who are married or in a union)
- Adolescent birth rate
- Antenatal care coverage (at least one visit and at least four visits)
- Unmet need for family planning

Goal 4 – Develop a Global Partnership for Development

Target:

In co-operation with developing countries, develop and implement strategies for decent and productive work for youth

Indicators

- Unemployment rate of young people aged 15–24 years (total and by sex)

Vital Rates are reliable barometers of socio-economic conditions of the state. Birth Rate, Death Rate and IMR are found to be higher in rural areas compared to urban areas both in Tamil Nadu and at All-India. There are also gender differences in these parameters. It may be noted that the vital Rates obtaining for All-India are comparatively higher than that of for Tamil Nadu.

India's Global Position in Terms of Socio-demographic Parameters:

Country	**Life Expectancy at Birth (years)**		**Under-five Mortality Rate (per 1000 live births)**			**Infant Mortality Rate (Per 1000 live births)**			**Maternal Mortality Ratio (per 100,000 live births)**	
	2000-05	**2013**	**1990**	**2002**	**2013**	**1990**	**2002**	**2014**	**2000**	**2011**
China	71	75.3	49	39	14	38	31	12	56	37
India	**64**	**66.4**	**123**	**93**	**56**	**80**	**67**	**44**	**540**	**200**
Nepal	60	68.4	145	91	42	100	66	34	740	170
Pakistan	61	66.6	128	107	86	96	83	69	500	260
Sri Lanka	72	74.3	23	19	10	19	17	8	92	35
Bangladesh	61	70.7	144	77	41	96	51	33	380	240
South Asia	63	67.2	126	95		84	69		NA	202

Source: UNDP, Human Development Report.

Declining in Death Rate is associated with increase in per capita income. The outcome of those changes in reflected in the form of rising Life Expectancy at Birth. Improvements in health care are paid for by individuals and by the public treasury out of

the incomes made higher by sweeping changes in productivity. The discovery of very low cost technology to reduce the morbidity and mortality is also one of the causative factors for declining death rate in the country. Increasing number of dispensaries, training of midwives, elimination of stagnant and polluted water, provision of safe drinking water, sewage disposals, slum clearance and better housing also contribute to improved health status and increased labour productivity.

Health Care Infrastructure:

Type	1981	2003	2008	2010	2013
SC/PHC/CHC	57363	163195	173770	173795	181319
Dispensaries and hospitals	23555	38031	33855	28472	29274
Nursing personnel	143887	832000	1572363	1073638	1562186
Doctors(registered)	26870	21741	29990	34392	26878

Source: National Health Profile, 2008.

The country has a well structured three tier public health infrastructure, comprising community Health Centres (CHCs), Primary Health Centres (PHCs) and sub centres (SCs) spread across rural and semi-urban areas and tertiary medical care providing multi-specialty hospitals and medical colleges located almost exclusively in urban areas. Improvements in health indicators can be attributed in part to this network of health infrastructure.

Shortfall in health infrastructure at all India level:

As per 2001 population	Required	Existing	Shortfall	% shortfall
Sub-centres	158792	144998	20903	13.16
PHCs	26022	22669	4803	18.46
CHCs	6491	3910	2653	40.87

Source: Eleventh Five Year Plan Document, National Planning Commission, 2007-2012

Economic growth contributes significantly to reduce inequality in income which results the reduction of poverty. An economy should channelize the public resources in the right direction to promote human development. The Eleventh five year plan aims to strengthen every aspect of healthcare system- Preventive, promotive, curative, palliative and rehabilitative. This will be accompanied by emphasis on access to clean drinking water, sanitation, diet, hygiene and feeding practices which also significantly affect the health status of the people.

The target to ensure an efficient public health delivery system was launched in 2005 under the national rural health mission. Some of the important targets are:

1. Primary Health Centers (nearly 30,000) with 3 staff nurses to provide round the clock service by 2010.
2. 1800 Taluka or Sub Divisional Hospitals and 600 District Hospitals to be strengthened to provide quality health services by 2012.
3. Mobile Medical Units for each District by 2009.

Mal nutrition is the key problem to be addressed to provide healthcare in rural India. A variety of interventions consisting of dietary diversification, nutrient supplementation and public health measures involving better hygiene, sanitation and deworming will be undertaken to tackle the problem of malnutrition.

The public health system in our country has various drawbacks like Centralized planning instead of decentralized planning, Inflexible financing and limited scope for innovations, Inadequate provision of human resources, No prescribed standards of quality, Semi-used or dysfunctional health infrastructure and Inability to mobilize AYUSH and RMPs and other locally available human resources.

Review of Literature.

Wagstaff, Paci and Joshi (2001) made an attempt to identify the causes of inequalities in health in Britain. They tested the hypotheses (a) how far are health inequalities between poor and better-off people due to poor people living in unhealthy areas; and (b) how far are inequalities in health adulthood due to inequalities in childhood and human capital investment and to inequalities in parental status and human capital. They used decomposition analysis to assess the contribution of two factors to health inequality. Study revealed that Natural Child Development Study (NCDS) cohort members, who were well-off at age 33 had

mothers who were better educated than poorer cohort members and to have fathers from the higher social classes. The bulk of health inequality amongst NCDS cohort members at age 33 stems not from where they live, or who their parents were, but rather who they are. A full true quarter of inequality in ill-health is explained by inequality in adult variables like income, housing status, spouse's education and demographics and household composition.

T.K.Roy, Sumati Kulkarni, and Y. Vaidehi(2004) in their analysis of differentials between four major groups in Indian society (SC, ST, OBC women and women in 'other' category) brought out the effect of social stratification on utilization of healthcare programmes and nutritional status. The 1999 Sample Registration system (SRS) estimates of infant mortality rate ranges between 63 and 90 in the four larger northern states namely Uttar Pradesh, Bihar, Madhya Pradesh and Rajasthan. Among them, Madhya Pradesh shows very high level of inequality by caste/tribe in all the variables considered for the study. In terms of utilization of health programmes and nutrition related variables, for women in similar socio-economic group, there is no inequality by caste/tribe in Karnataka. Women in Andhra Pradesh, except the scheduled tribes, are equally likely to go in for ANC or have safe delivery, compared to similar socio-economic group women belonging to any caste. The extent of inequality is highest in West Bengal in terms of availability of health facility within locality. Overall, the study finds that for similar socio-economic characteristics, Sc's and ST's are likely to have better nutrition and are more likely to utilize the programme services, compared to women of other groups.

Angus Deaton examines the impact of globalization on health, through a number of links. The first is the direct link that associates a larger volume of trade and interaction among nations with changes in health status through the income channel. He examines the idea that globalization could be bad for population health if it leads to an increase in income inequality. Finally, the paper turns to what Deaton seems to consider the main avenue by which globalization can affect health, that is, through the transfer of knowledge and techniques. This represents a kind of globalization of public goods. Both the cross-sectional and time series data suggest the impact of higher income on health status, as measured by life expectancy, is positive, but this effect diminishes at higher income

levels: increases in average income seem to have a larger impact on health in poorer countries, and yet improvements in life expectancy have fallen off in countries that have nonetheless continued to exhibit positive growth. This empirical evidence on the relationship between the level of and changes to income and life expectancy supports the proposition that the transfer of ideas and techniques to poor countries has played a significant role in the global evolution of health status. In his discussion on globalization and the determinants of health, Deaton explores in detail the dynamics of mortality due to cardiovascular and lung disease in the United States and the United Kingdom. This analysis highlights the importance, on the one hand, of the transfer of technology and surgical techniques and, on the other hand, of behavioral norms (such as smoking) in determining health trends. The implication is that just as disease-specific mortality rates in these two rich countries have responded to the acquisition and adoption of new techniques, so too the health of people in the developing world has improved and will continue to improve with the transfer of technologies and ideas.

Objectives of the present study:

- To estimate the trend of health indicators for India with special reference to Tamil Nadu.
- To identify the factors determining the status of health care in the study area.
- To analyse the gender discrimination in preference, access and spending to acquire health in the study area.

Sample Design and area of study:

A village namely 'Tirukalukundram' nearby Tambaram which is the sub urban area of Chennai is selected as the study area.

Sixty respondents have been chosen randomly to collect the information related to Health care system in their area. A well designed questionnaire has been used for gathering facts.

For the secondary data the researchers has collected information from Economic Survey of India for various years. From 1971 to 2012 which includes the benchmark year 1991 is the period selected for this present study.

Statistical tools used:

Frequency tables: The frequency tables are used to understand the divergence in various aspects of consumer behavior.

Various functional forms of Regression Models like **Double-log model, Semi-log model and Dummy variable models** are used to estimate the cause and effect relationship between the dependent and independent variables considered in this study.

Trend of healthcare indicators: $\mathbf{Ln\ Y_t = \alpha + \beta\ (time) + U_t}$ **for the period 1971-2012**

Variable	Constant	β value	't' value	Sig value	R^2	F value
Per capita income @ current price	-231.021	0.106	-109.294	0.01	0.99	12992.637
National income @ current price in crores of rupees	-231.021	0.123	81.785	0.01	0.99	6688.710
IMR- India	60.077	-0.028	-48.868	0.01	0.98	2388.118
IMR- Tamilnadu	79.989	-0.038	-29.228	0.01	0.95	854.280
Death rate- India	44.475	-0.021	-38.940	0.01	0.97	1516.348
Death rate- Tamilnadu	39.489	-0.019	-17.363	0.01	0.883	301.478
Birth rate- India	29.20	-0.013	-30.636	0.01	0.95	938.587
Birth rate- Tamilnadu	40.893	-0.019	-34.703	0.01	0.968	1204.266

The above table clearly shows that there is a positive trend in net national product at factor cost and the per capita income during the period 1971 – 2012. The percapita income had grown at the rate of 10.6 percent per annum while the national income had grown at the rate of 12.3 percent per annum. The health indicators show the negative trends as 2.8, 2.1 and 1.3 percent respectively for IMR, Death rate and Birth rate for India. The same indicators for rural Tamilnadu are also shows the negative trend

as 3.8, 1.9 and 1.9. This clearly indicates that Tamilnadu performed better in providing health care to its population.

It is also essential to measure the relationship between the income and the health indicators of the nation. Double log model have been estimated to measure the elasticity. One can measure the percentage change in the birth rate, death rate and infant mortality rate with respect to a percent change in National income as well as per capita income of India.

$\mathbf{Ln\ Y_t = \alpha + \beta\ (Ln\ X_t) + U_t}$ is used to estimate the following relationship

Regression Results for estimating elasticity

Ln_br_India = 4.744 – 0.105 (Ln_nat.inc)

t (-26.99)* $\mathbf{R^2 = 0.948}$ **F = 728.969**

Ln_dr_India = 4.592 – 0.172 (Ln_nat.inc)

t (-40.063)* $\mathbf{R^2 = 0.976}$ **F = 1605.046**

Ln_imr_India = 7.396 – 0.227 (Ln_nat.inc)

t (-41.899)* $\mathbf{R^2 = 0.978}$ **F = 1755.487**

Ln_br_India = 4.423 – 0.123 (Ln_nat.inc_per)

t (-30.980)* $\mathbf{R^2 = 0.96}$ **F = 959.780**

Ln_dr_India = 4.047 – 0.199 (Ln_nat.inc_per)

t (-34.996)* $\mathbf{R^2 = 0.968}$ **F = 1224.70**

Ln_imr_India = 6.694 – 0.264 (Ln_nat.inc_per)

t (-47.589)* $\mathbf{R^2 = 0.983}$ **F = 2264.745**

The above regression results show that ten percentage change in the national income leads to one percent decline in the birth rate of India. This will also leads the decline of Death rate by 1.72 percent and IMR by 2.27 percent. Clearly the economic growth brings the expected change in the health status of the economy. The researcher also estimates

the elasticity with respect to per capita income. Ten percent change in per capita income in India brings the reduction of 1.23, 1.9 and 2.64 respectively for Birth rate, Death rate and IMR for India. This again proves that percapita income is the key indicator for the development than the over all national income.

The researchers also make an attempt to analyses the ground reality of health care scenario in rural Tamilnadu. Sixty respondents have been selected randomly from a village 'Thirukalukundram' in Kanjipuram district of Tamilnadu. A well designed questionnaire have been used to collect the information regarding the availability , access and expenditure pattern for acquiring health care by the respondents of the study area.

Total health expenditure for male per month (in Rs.)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	200 - 300	11	18.3	18.3	18.3
	300-500	24	40.0	40.0	58.3
	Above 500	25	41.7	41.7	100.0
	Total	60	100.0	100.0	

Total health expenditure for female per month (in Rs.)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 100	7	11.7	11.7	11.7
	100 - 200	33	55.0	55.0	66.7
	200 - 300	16	26.7	26.7	93.3
	above 300	4	6.7	6.7	100.0
	Total	60	100.0	100.0	

Total family health expenditure per month (in Rs.)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	200 - 300	1	1.7	1.7	1.7
	300 - 400	11	18.3	18.3	20.0
	400 - 500	26	43.3	43.3	63.3
	above 500	22	36.7	36.7	100.0
	Total	60	100.0	100.0	

The above frequency tables shows that around 80% of the respondents are spending more than 400 rupees as health expenditure per month for their family. It is also found that the average spending for male members are significantly higher than the average spending for female members of the family

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R^2	F
		B	Std. Error	Beta				
1	(Constant)	-274.388	281.851		-.974	.334	0.42	13.42
	gender 0 = female; 1= male	47.316	77.179	.063	.613	.542		
	Age in years	4.015	4.721	.089	.851	.399		
	income per month in rupees	.052	.008	.666	6.339	.000	D.W	1.829

a. Dependent Variable: per capita health expenditure per month in rupees

The above regression result shows that every extra 1 rupee income leads to the increase of 5 paise in health expenditure.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R^2	F
		B	Std. Error	Beta				
1	(Constant)	178.503	307.683		.580	.564	0.50	13.61
	gender 0 = female; 1= male	-490.742	199.532	-.650	-2.459	.017		
	Age in years	2.317	4.476	.052	.518	.607		
	income per month in rupees	.021	.013	.267	1.575	.121		
	dummyincome	.046	.016	.837	2.895	.005		

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R^2	F
		B	Std. Error	Beta				
1	(Constant)	178.503	307.683		.580	.564	0.50	13.61
	gender 0 = female; 1= male	-490.742	199.532	-.650	-2.459	.017		
	Age in years	2.317	4.476	.052	.518	.607		
	income per month in rupees	.021	.013	.267	1.575	.121		
	dummyincome	.046	.016	.837	2.895	.005		

a. Dependent Variable: per capita health expenditure per month in rupees

The researchers have also introduced the product dummy to find out the difference in rate of change of health care expenditure due to change in income with respect to the variable gender. The result shows that every 1 rupee increase income brings the additional 2 paise of health expenditure for women. It is found that every additional 1 rupee income brings the additional health expenditure of 6 paise for men. This clearly shows that there is discrimination in providing health care for women.

Findings and Conclusion

- The health indicators show the negative trends as 2.8, 2.1 and 1.3 percent respectively for IMR, Death rate and Birth rate for rural India. The same indicators for Tamilnadu are also shows the negative trend as 3.8, 1.9 and 1.9. These clearly indicate that Tamilnadu performed better in providing health care to its population.
- Ten percentage change in the national income leads to one percent decline in the birth rate of India. This will also leads the decline of Death rate by 1.79 percent and IMR by 2.1 percent.
- Average spending for male members are significantly higher than the average spending for female members of the family

Suggestions and Recommendations:

- People should be adequately educated to take preventive treatment rather than curative treatment.

- Education is the best contraceptive for population stabilization which will in turn help in realizing development goals.
- There should be huge hike in public investment in the health sector so that the expenditure on health and nutrition will be three percent of the GDP
- Large health care imbalances in infrastructure creation be removed.
- Access to essential health care is to be universally assured.
- Private health care delivery lacks in protocols and audit of medicine procedures and prescribes expensive and unnecessary tests for profit diagnostic centers, etc.
- The functioning of the government hospitals should be fine tuned to a great extent so that their competitive edge will be enhanced on par with private hospitals. This strategy will serve dual purpose – more utilization of health services under public sector and suppressing the influence of the hospitals under private sector for the good of the poor.
- Food security is the basis for economic security. The crux is availability of food, access to food through enhanced purchasing power enhanced purchasing power of people and food absorption, which is the ability to assimilate the food consumed.
- Malnutrition is a state of ill health result from an inadequate or improper diet, usually measured in terms of average daily protein consumption. Protein is particularly important for brain development in the first three years of the life during which the brain grows to 90 percent of its full size. Brain damage due to protein deficiency is irreversible. Therefore the children below the age of three should get a balanced and adequate diet.
- To meet nutritional requirements of the growing population and tackle global hunger, M.S.Swaminathan, Research Foundation, advocates multi-pronged strategy. The worrisome trends in global hunger, exacerbated by high food prices must be tackled with a multi-pronged strategy to increase small farm productivity and profitability raise non-farm incomes and strengthen nutrition safety nets..

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