International Research Journal of Education and Technology

Peer Reviewed Journal, **ISSN 2581-7795**

Contribution of Health Sector to the Human Development of Andhra Pradesh

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ABSTRACT

The Government of Andhra Pradesh has taken many initiatives for the development of health sector in order to to increase the Human Development Indicators in Andhra Pradesh. They include promoting institutional deliveries, strengthening of health infrastructure, training of service providers in management of emergency obstetric care and skilled birth attendance, providing ante-natal and post-natal care, organising village health and nutrition days, engagement of an accredited social health activist (ASHA) in the community, establishing referral systems including emergency referral transport, training of service providers in integrated management of neo-natal & childhood illness, training of ASHAs in Home based new born care, training of health care providers in essential new-born care and resuscitation, providing new-born care at all levels, promoting exclusive breastfeeding and complementary feeding, establishment of nutritional rehabilitation centres, strengthening routine immunization programme, focusing on reduction in morbidity and mortality due to acute respiratory infections (ARI) and diarrheal diseases, introduction of name based web enabled tracking of pregnant women & children (Mother and Child Tracking System) to ensure antenatal, intra-natal and postnatal care to pregnant women and care to new-borns, infants and children. All these measures have resulted in the growth of Life Expectancy at Birth, which is recognized by the UNDP as the outcome of Health Sector Development and included as the indicator for measuring Human Development Index. In this context, the present paper assessed the relationship between Human Development Index and Life Expectancy at Birth in Andhra Pradesh during the post bifurcation period.

Keywords: Life Expectancy at Birth, Human Development, Health Sector, Budget Allocations.

1. Introduction:

United Nations Development Programme (UNDP) has identified Life Expectancy at Birth (LEB) as the outcome of Health Development of a Country/State and hence considered the Life Expectancy at Birth (LEB) as variable for the estimation of Health Attainment Index, which is a part of Human Development Index. Therefore, Life Expectancy at Birth (LEB) is considered as independent variable and Human Development Index as dependent variable in the estimation of the regression analysis for Human Development on Health Development.

2. Trends in the Human Development Index of Andhra Pradesh:

As per the UNDP, the HDI classifications are based on HDI fixed cutoff points, which are derived from the quartiles of distributions of the component indicators. The cutoff points are HDI of less than 0.550 for low human development, 0.550–0.699 for medium human development, 0.700–0.799 for high human development and 0.800 or greater for very high human development (UNDP, HDR 2025). The trends in the Human Development Index of Andhra Pradesh during the study period have been provided in Table 5.1 and depicted in Chart – 1. It is obvious from the Table that the Human Development Index has been increased from 0.614 in 2014 to 0.642 in 2022 for Andhra Pradesh during the period of study. Therefore, it is concluded that Andhra Pradesh has been considered as Medium Human Development State, because the value of HDI ranges between the cutoff points 0.550 and 0.699 for medium human development category. However, the year-wise growth is not uniform and has more fluctuations starting from (-) 0.79% in 2021 to 1.93% in 2016 for Andhra Pradesh. It is found that there is no significant growth in the Human Development Index during the years from 2018 to 2021 and this might be due to COVID 19 Pandemic conditions, but there is high growth in 2022 and 2023 due to speedy recovery from COVID 19 Pandemic conditions. The linear and quadratic trend lines of HDI for Andhra Pradesh indicates that quadratic trend line is better fit than linear trend line because the coefficient of determination for quadratic trend line (0.681) is higher than the linear trend line (0.484). This result is agreeable because the COVID 19 Pandemic during 2019 to 2021 impacted negatively on Human Development Index in Andhra Pradesh.

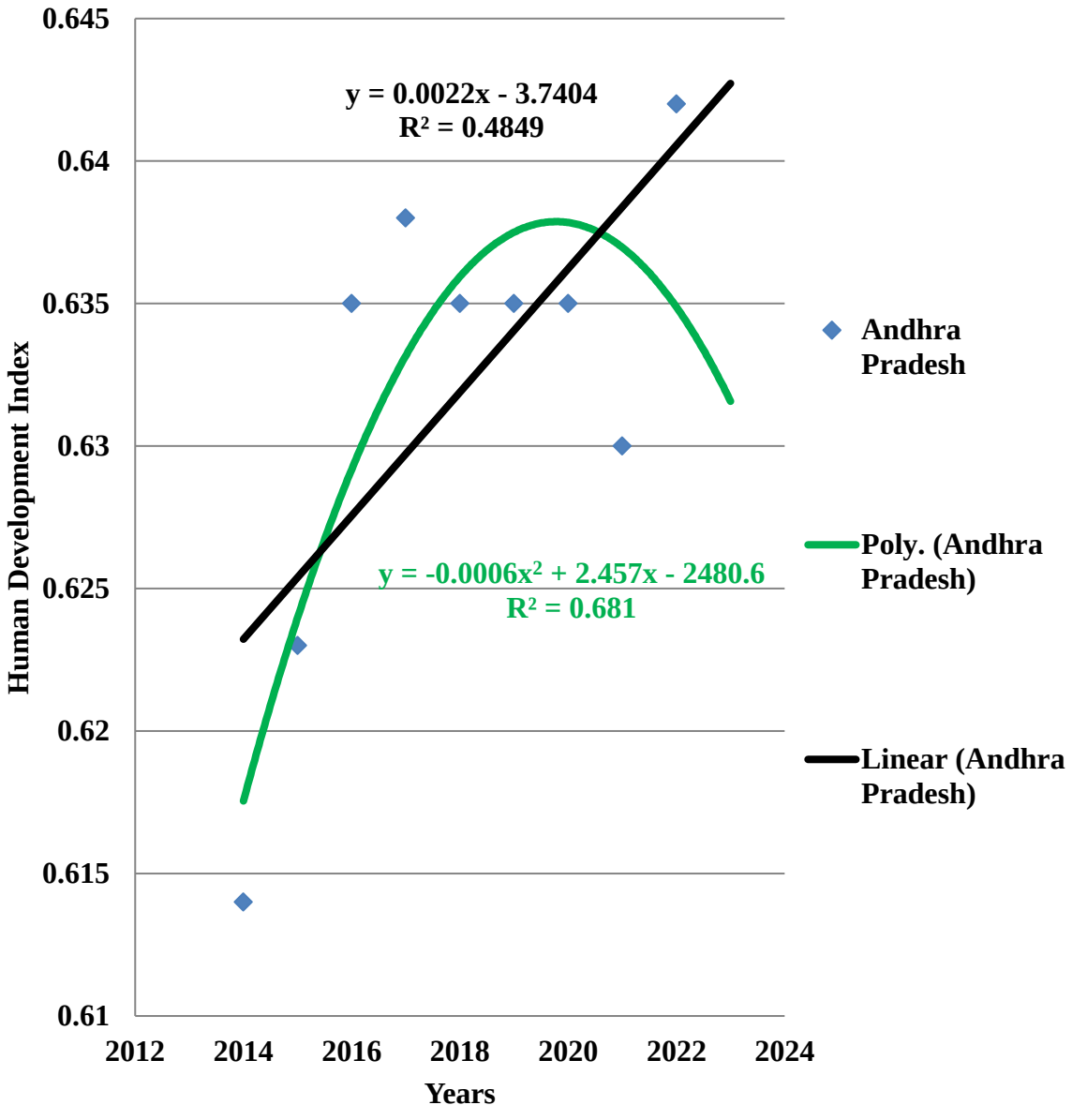
Table – 1: Trends in the values of Human Development Index in Andhra Pradesh

Year	Human Development Index (HDI)	Annual Growth of HDI (%)
2014	0.614	-----
2015	0.623	1.47
2016	0.635	1.93
2017	0.638	0.47
2018	0.635	-0.47
2019	0.635	0.00

2020	0.635	0.00
2021	0.630	-0.79
2022	0.642	1.90

Source: UNDP Human Development Data Centre

Chart - 1: Trends in the Human Development Index of Andhra Pradesh



3. Trends in the Life Expectancy at Birth in Andhra Pradesh

According to the Human Development Report 2025, the Life expectancy at birth represents the number of years a newborn infant could expect to live if prevailing patterns of age-specific mortality rates at the time of birth stay the same throughout the infant's life (UNDP, HDR 2025). The trends in the Life Expectancy at Birth in Andhra Pradesh during the study period has been provided in Table – 2 and depicted in Chart – 2. It is obvious from the Table that the Life Expectancy at Birth for persons in Andhra Pradesh has been increased from 68.5 years in 2014 to 70.7 years in 2023. Similarly, the Life Expectancy at Birth for male in Andhra Pradesh has been increased from 66.3 years in 2014 to 68.5 years in 2023. Further, Life Expectancy at Birth for female in Andhra Pradesh has been increased from 70.8 years in 2014 to 73.3 years in 2023. However, the year-wise growth in the Life Expectancy at Birth during the period of study is not uniform and has more fluctuations starting from (-) 0.42% in 2021 to 0.87% in 2016 for persons in Andhra Pradesh, from (-) 0.87% in 2021 to 1.34% in 2016 for males and from (-) 0.28% in 2017 to 0.83% in 2023.

Table – 2: Trends in the values of Life Expectancy at Birth in Andhra Pradesh

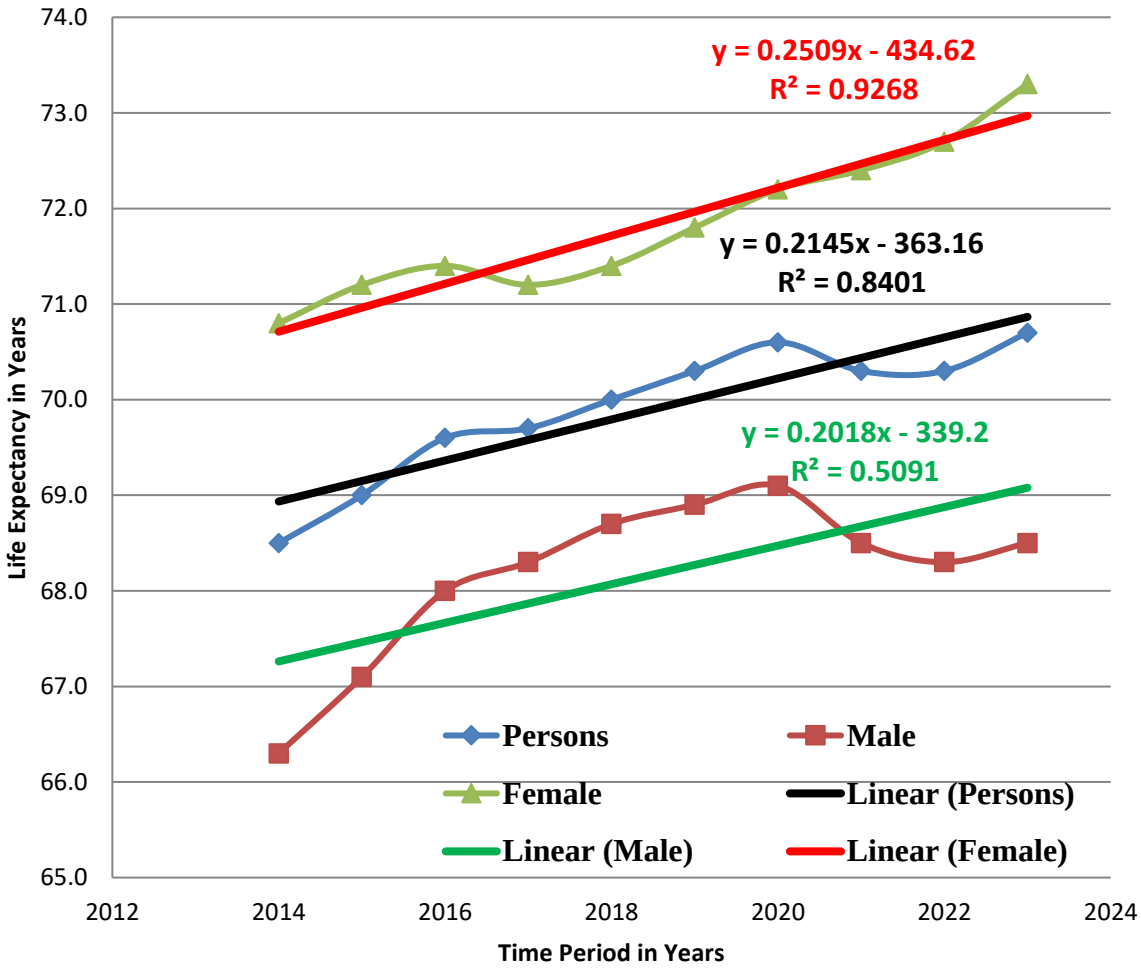
Estimation Period	Middle Year of the Period	Life Expectancy at Birth in Andhra Pradesh (Years)			Annual Growth in Life Expectancy at Birth (%)		
		Persons	Male	Female	Persons	Male	Female
2010-14	2012	68.5	66.3	70.8	------	------	------
2011-15	2013	69.0	67.1	71.2	0.73	1.21	0.56
2012-16	2014	69.6	68.0	71.4	0.87	1.34	0.28
2013-17	2015	69.7	68.3	71.2	0.14	0.44	-0.28
2014-18	2016	70.0	68.7	71.4	0.43	0.59	0.28
2015-19	2017	70.3	68.9	71.8	0.43	0.29	0.56
2016-20	2018	70.6	69.1	72.2	0.43	0.29	0.56
2017-21	2019	70.3	68.5	72.4	-0.42	-0.87	0.28
2018-22	2020	70.3	68.3	72.7	0.00	-0.29	0.41
2019-23	2021	70.7	68.5	73.3	0.57	0.29	0.83

Source: SRS Based Abridged Life Tables for various years

The linear trend lines of Life Expectancy at Birth for persons, males and females in Andhra Pradesh indicates that the trend lines are better fit for females than males and persons. The coefficient of determination of the trend line of Life Expectancy at Birth for females (0.926) is higher than the coefficient of determination of persons (0.840) and it is higher than the coefficient of determination of males (0.509). It is, therefore, inferred

that the socio-economic conditions of Andhra Pradesh during 2017 to 2021, which includes the period of COVID 19 Pandemic, have impacted negatively on Life Expectancy at Birth in for Andhra Pradesh.

Chart -2: Trends in the Life Expectancy at Birth in Andhra Pradesh



4. The contribution of Health Sector to the Human Development in Andhra Pradesh:

The primary objective of this section of the paper is to test the association between Human Development Index and Health Sector Outcome identified by the United Nations Development Programme (UNDP) for the preparation of Health Attainment Index and Human Development Index. Life Expectancy at Birth is the health

outcome identified by the group of experts on Human Development. The contribution of the Health Sector to the Human Development of Andhra Pradesh is estimated through the following Econometric Model:

$$HDI = \beta_0 + \beta_1 LEB + \varepsilon_i$$

Where HDI = Human Development Index; LEB = Life Expectancy at Birth; and ε_i is a stochastic error term that explains the influence of all other variables not included in the model. The regression parameters, β_0 and β_1, represents the constant term, regression coefficient of Life Expectancy at Birth. The Econometric Model is estimated by using the SPSS software and results are provided in Table – 3 for Andhra Pradesh.

Table – 3: Regression Analysis for assessing the impact of Health Development on Human Development in Andhra Pradesh

Dependent Variable: Human Development Index of Andhra Pradesh

Model Summary	Model – I	Model – II	Model – III
Independent Variable (Predictor)	Life Expectancy at Birth (Persons)	Life Expectancy at Birth (Males)	Life Expectancy at Birth (Females)
Correlation Coefficient (R)	0.834	0.845	0.525
Coefficient of Determination (R^2)	0.695	0.715	0.276
Adjusted R^2	0.652	0.674	0.172
Std. Error of the Estimate	0.005029	0.004865	0.007752
Durbin-Watson Statistic	1.503	1.601	0.931
Analysis of Variance Test (F Test)	15968.008	17.540	2.665
Level of Significance	0.005	0.004	0.147
Regression Coefficients			
Constant (β_0)	**-0.288**	**-0.214**	**0.198**
Standard Error of (β_0)	0.230	0.202	0.266
Student 't' Test for (β_0)	-1.251	-1.058	0.744
Level of Significance for (β_0)	0.251	0.325	0.481
Regression Coefficient (β_1)	**0.013**	**0.012**	**0.006**
Standard Error of (β_1)	0.003	0.003	0.004
Standardized Coefficients (Beta)	0.834	0.845	0.525
Student 't' Test for (β_1)	3.996	4.188	1.633
Level of Significance for (β_1)	0.005	0.004	0.147

Source: Estimated by using SPSS and the data presented in Tables – 1 and 2.

It is obvious from the Table – 3 that there is a positive relationship between Human Development Index and Health Development Indicator – Life Expectancy at Birth. The coefficient of correlation between Human

Development Index and Life Expectancy at Birth is positive at higher values of 0.834 for Persons, 0.845 for males and 0.525 for females in Andhra Pradesh during the period of study. Further, the value of the Coefficient of Determination (R^2) of the Regression Models fitted with Life Expectancy at Birth (Persons) is 0.695 and Life Expectancy at Birth (Males) is 0.715 and hence they are statistically best fit and significant models, but the value of the Coefficient of Determination (R^2) of the Regression Model fitted with Life Expectancy at Birth (Females) is 0.276 only and hence, it is statistically not best fit model. Therefore, it is concluded that the health sector development outcome has a positive influence on the human development of Andhra Pradesh.

It is observed from the Table that the regression coefficient of the independent variable (Life Expectancy at Birth) for persons is the highest at 0.013 followed by males at 0.012 and females at 0.006. In other words, it is clear that a one year increase in the Life Expectancy at Birth (Persons) will increase 0.013 units in the Human Development Index of Andhra Pradesh, a one year increase in the Life Expectancy at Birth (Males) will increase 0.012 units in the Human Development Index of Andhra Pradesh and a one year increase in the Life Expectancy at Birth (Females) will increase only 0.006 units in the Human Development Index of Andhra Pradesh. However, the Student 't' Test for (β_1) values and their levels of significance indicates that the Regression Models fitted with Life Expectancy at Birth (Persons) and Life Expectancy at Birth (Males) are statistically significant, but the Regression Model fitted with Life Expectancy at Birth (Females) is statistically insignificant.

Finally, the econometric analysis presented above concluded that there is significant positive association between Human Development Index and Life Expectancy at Birth. Therefore, it is suggested that the Governments of Andhra Pradesh should focus on the improvement of the Health Sector by providing higher budget allocations.

5. Conclusions:

United Nations Development Programme (UNDP) has identified Life Expectancy at Birth as the outcomes of Health Development of a Country/State. Hence, the research scholar has considered Life Expectancy at Birth for persons, males and females as independent variables and Human Development Index as dependent variable in the estimation of the regression analysis for assessing the impact of Health Sector Development on Human Development in Andhra Pradesh.

Null Hypotheses formulated for testing the association between Human Development Index Life Expectancy at Birth are as follows:.

(a) There is no significant association between Human Development Index and Life Expectancy at Birth for persons;

(b) There is no significant association between Human Development Index and Life Expectancy at Birth for males; and

(c) There is no significant association between Human Development Index and Life Expectancy at Birth for females.

The research scholar has also formulated the alternative hypotheses between Human Development Index and Life Expectancy at Birth, which are as follows:

(a) There is a significant association between Human Development Index and Life Expectancy at Birth for persons;

(b) There is a significant association between Human Development Index and Life Expectancy at Birth for males and

(c) There is a significant association between Human Development Index and Life Expectancy at Birth for females.

After formulation of the hypotheses, the research scholar has surveyed the data on the variables and conducted the regression analysis with the help of SPSS software. The estimated regression model proves that there is a highly significant positive relationship between human development Index and Life Expectancy at Birth for persons. Similarly, the estimated regression model proves that there is a highly significant positive relationship between human development Index and Life Expectancy at Birth for males.

Therefore, it is suggested that the Government of Andhra Pradesh should focus on the improvement of the Health Sector development by providing higher budget allocations.

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