

# Decomposition of Change in Healthy Literate Working Life Expectancy

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**Abstract:-** The study of social development involves the improvement of human quality of life by civilizing the social, economic, cultural, political, and environmental conditions of a nation. The indicator Healthy Literate Working life expectancy (HLWLE) combines the human quality of life such as healthy, literate, and working factors in a single index. To describe the difference in HLWLE over two different periods or genders; we have analyzed the decomposition of the change in healthy literate working life expectancy for India and its selected states. Das Gupta (1993) four-factor cases method is used for the decomposition of the change in the number of person-years lived with healthy, literate, and working states. The analysis of the decomposition of sex differences in India shows that males could expect to live a better life with a healthy, literate, and working condition as compared to that of females. This may be due to the improvement in the employment and the literacy condition of males than that of females. An increase in the life expectancy of females has not translated fully into working and literate life years. The finding of the study highlights the importance of Government and Non-Government involvement towards the improvement of literacy and work force participation, especially among females. Again, decomposing the difference between HLW life years between 2001 and 2011 gives a paramount conclusion that emerged from the study is that the state Punjab portrays the issue of unemployment among both the sexes. This should be considered as the greatest concern by the policy makers.

**Keywords:-** Decomposition; Healthy Effect; Literacy Effect, Working Effect, Life Expectancy.

## I. INTRODUCTION

The study of social development involves the improvement of human quality of life by civilizing the social, economic, cultural, political, and environmental conditions of a nation. Social indicators are used to evaluate how well a country is developing in key areas such as health, education, and employment. To develop the human quality of life, elements such as reading and writing skills, active participation in the labour force, and both healthy and unhealthy years of life are the essential dimension of a healthy life. Literacy is probably the most dramatic and significant indicator for the individual and the rest of society as well [11]. In contrast, low literacy has an adverse effect on the health of an individual. Many studies have shown that patients with

inadequate literacy have less health-related knowledge, receive less preventive care, have poorer control of their chronic illnesses, and are hospitalized more frequently than other patients [4]. People with poor literacy skills are more likely to be unemployed, have low incomes, and have poor health behaviours, which in turn can be linked to lower life expectancy [13]. To access appropriate medical amenities and for acquiring a healthy life, people should be well paid for their work. But, lower literacy skills confine people to less paid positions or jobs with lower pay scales which in turn affect the health of a person. It can be said that the improvement in the health status of a person leads to an increase in the productivity in labour force and the level of a person's productivity is enhanced by his level of education.

Thus, the elements of health, literacy, and employment are interlinked with each other. The indicator Healthy Literate Working Life Expectancy (HLWLE) combines healthy, literate, and working factors in a single index. It can be defined as the average number of years lived by a person with healthy, literate, and working states simultaneously. The concern over social welfare has increased as the world moved into the 21<sup>st</sup> century and the developed nations are distressed about the burden of providing health care, education, the creation of jobs, and the urban size and growth of their cities [11]. To describe the difference in HLWLE over two different places or genders; one has to partition the difference in HLWLE into its contributing factors or component. Knowing which factors contribute most to describe the differences in the healthy, literate, working population, one can point at possible determinants and can support in the assessment of past trends and the inequalities. To do so, the method of decomposition is the most convenient.

In 1955, Kitagawa proposed the first decomposition method to gain insight into differences between the overall rates between two populations. In demography, several methods were suggested by several researchers on decomposing a difference between two life expectancies over time or place [8]. Some methods focus on discrete differences between two life expectancies (Pollard 1982; Arriaga 1984; Pressat 1985; Andreev, Shkolnikov, and Begun 2002; Firebaugh et al. 2014) while, others consider continuous changes (Vaupel 1986; Keyfitz 1977; Vaupel and Canudas-Romo 2003; Beltran-Sanchez, Preston, and Canudas-Romo 2008; Horiuchi, Wilmoth, and Pletcher 2008).

Moreover, the indicator healthy literate working life expectancy contains the four factors viz. healthy, literate, working and mortality factors. In respect of four-factor cases, Das Gupta (1993) provided a general method capable of handling any number of factors that are developed along the lines suggested by Kitagawa (1955). Therefore, to decompose the change in the healthy, literate, and working life, one can use the method suggested by Das Gupta (1993) four-factor cases.

**II. OBJECTIVES**

In this paper first, we try to formulate the decomposition of the change in the number of person-years lived with a healthy, literate, and working state. Then to apply this decomposition method to the gender differences (male-female) and periods difference (2001 & 2011) in the number of person-years lived with healthy, literate, and working state for India and some of its selected states from various zones. The selected states are Assam from the North-East, Gujarat from the West, Kerala from the South, Odisha from the East, Punjab from the North, and Uttar Pradesh from the Central zones of India.

**III. FORMULATION OF THE DECOMPOSITION OF THE CHANGE IN HEALTHY LITERATE WORKING LIFE EXPECTANCY (HLWE)**

A healthy literate working life expectancy can be expressed as:

$$hlwe_x^0 = \frac{1}{l_x} \sum_x^{\omega} [n^{Phlwx} * n^{Lx}] \tag{1}$$

where,  $l_x$  be the number of survivors at the age  $x$  in a life table and  $L_x$  denotes the total number of years lived by a cohort in the age group  $[x, x+n)$ .  $n^{Phlwx}$  is the proportion of healthy literate and working persons in the above age groups respectively.

According to Das Gupta (1993), let  $A, B, C,$  and  $D$  be the four factors so that the rate  $R$  can be expressed as,

$$R=ABCD \tag{2}$$

Let  $R_1$  and  $R_2$  be the rate of population ‘1’ and population ‘2’, then the rates in population 1 and population 2 be,

$$R_1=A^1B^1C^1D^1, \\ R_2=A^2B^2C^2D^2$$

Following Das Gupta (1993, equation 2), the difference between rates of populations ‘1’ and ‘2’ can be expressed as:

$$R_2 - R_1 = \left( \frac{B^2 C^2 D^2 + B^1 C^1 D^1}{B^2 C^2 D^1 + B^2 C^1 D^2 + B^1 C^2 D^2 + B^1 C^1 D^2 + B^1 C^2 D^1 + B^2 C^1 D^1} \right) +$$

$$(A^2 - A^1) +$$

$$\left( \frac{A^2 C^2 D^2 + A^1 C^1 D^1}{A^2 C^2 D^1 + A^2 C^1 D^2 + A^1 C^2 D^2 + A^1 C^1 D^2 + A^1 C^2 D^1 + A^2 C^1 D^1} \right) +$$

$$(B^2 - B^1) + \left( \frac{A^2 B^2 D^2 + A^1 B^1 D^1}{A^2 B^2 D^1 + A^2 B^1 D^2 + A^1 B^2 D^2 + A^1 B^1 D^2 + A^1 B^2 D^1 + A^2 B^1 D^1} \right) +$$

$$(C^2 - C^1) + \left( \frac{A^2 B^2 C^2 + A^1 B^1 C^1}{A^2 B^2 C^1 + A^2 B^1 C^2 + A^1 B^2 C^2 + A^1 B^1 C^2 + A^1 B^2 C^1 + A^2 B^1 C^1} \right) +$$

$$(D^2 - D^1) \tag{3}$$

= A-effect + B-effect + C-effect + D-effect

To derive the required expression for the decomposition of the change in the number of person-years lived with the healthy, literate, and working state, we take the proportions of literate ( $P_l$ ), proportions of working ( $P_w$ ), proportions of healthy ( $P_h$ ) and the life table function ( $L_x$ ) be as the four factors. Thus, change in the number of person-years lived with the healthy, literate and working state can be estimated as:

$$\Delta_i P_{hlwx} L_x = i P_{hlwx} L_x^{(2)} - i P_{hlwx} L_x^{(1)} \tag{4}$$

where  $\Delta$  is the change between the population (2) and population (1). Thus, one can write the equation (3) in terms of the proportion of healthy, literate, and working states yields:

$$\Delta_i P_{hlwx} L_x = \left( \frac{P_l^2 P_w^2 L^2 + P_l^1 P_w^1 L^1}{P_l^2 P_w^2 L^1 + P_l^2 P_w^1 L^2 + P_l^1 P_w^2 L^2 + P_l^1 P_w^1 L^2 + P_l^2 P_w^2 L^1 + P_l^2 P_w^1 L^1} \right) * (P_h^2 - P_h^1) * (P_h^2 - P_h^1) + \left( \frac{P_h^2 P_w^2 L^2 + P_h^1 P_w^1 L^1}{P_h^2 P_w^2 L^1 + P_h^2 P_w^1 L^2 + P_h^1 P_w^2 L^2 + P_h^1 P_w^1 L^2 + P_h^2 P_w^2 L^1 + P_h^2 P_w^1 L^1} \right) * (P_l^2 - P_l^1) + \left( \frac{P_h^2 P_l^2 L^2 + P_h^1 P_l^1 L^1}{P_h^2 P_l^2 L^1 + P_h^2 P_l^1 L^2 + P_h^1 P_l^2 L^2 + P_h^1 P_l^1 L^2 + P_h^2 P_l^2 L^1 + P_h^2 P_l^1 L^1} \right) * (P_w^2 - P_w^1) + \left( \frac{P_h^2 P_l^2 P_w^2 + P_h^1 P_l^1 P_w^1}{P_h^2 P_l^2 P_w^1 + P_h^2 P_l^1 P_w^2 + P_h^1 P_l^2 P_w^2 + P_h^1 P_l^1 P_w^2 + P_h^2 P_l^2 P_w^1 + P_h^2 P_l^1 P_w^1} \right) * (L^2 - L^1) \tag{5}$$

Thus, change in the number of person-years lived with healthy, literate, and working states is the additive contribution of healthy, literacy, working, and mortality effect.

That is,

$$\text{Healthy effect: } \left( \frac{P_l^2 P_w^2 L^2 + P_l^1 P_w^1 L^1}{4} \right) +$$

$$\frac{P_l^2 P_w^2 L^1 + P_l^2 P_w^1 L^2 + P_l^1 P_w^2 L^2 + P_l^1 P_w^1 L^2 + P_l^1 P_w^2 L^1 + P_l^2 P_w^1 L^1}{12} \times (P_h^2 - P_h^1)$$

Literacy effect:  $\left( \frac{P_h^2 P_w^2 L^2 + P_h^1 P_w^1 L^1 + P_h^2 P_w^2 L^1 + P_h^2 P_w^1 L^2 + P_h^1 P_w^2 L^2 + P_h^1 P_w^1 L^2 + P_h^1 P_w^2 L^1 + P_h^2 P_w^1 L^1}{12} \right) \times (P_l^2 - P_l^1)$

Working effect:  $\left( \frac{P_h^2 P_l^2 L^2 + P_h^1 P_l^1 L^1 + P_h^2 P_l^2 L^1 + P_h^2 P_l^1 L^2 + P_h^1 P_l^2 L^2 + P_h^1 P_l^1 L^2 + P_h^1 P_l^2 L^1 + P_h^2 P_l^1 L^1}{12} \right) \times (P_w^2 - P_w^1)$

Mortality effect:  $\left( \frac{P_h^2 P_l^2 P_w^2 + P_h^1 P_l^1 P_w^1 + P_h^2 P_l^2 P_w^1 + P_h^2 P_l^1 P_w^2 + P_h^1 P_l^2 P_w^2 + P_h^1 P_l^1 P_w^2 + P_h^1 P_l^2 P_w^1 + P_h^2 P_l^1 P_w^1}{12} \right) \times (L^2 - L^1)$

The components, healthy, literate, and working effects are the difference in the number of person-years lived with the healthy, literate, and working states that due to a change in the proportions of healthy persons, literate persons, and the working persons correspondingly. Similarly, the mortality effect reflects a change in the number of person-years lived.

**IV. APPLICATIONS**

The data required for the study are age-specific proportions of the healthy, proportion of literate, and the proportion of working persons of both genders for the periods of 2001 and 2011. The Sample Registration System (SRS) based abridged life tables are taken for the life table’s data of India and the selected states as mentioned above. The data on literate and working population by age and sex are taken from the Census of India. Further, working population data are divided into a number of categories labelled as ‘main workers’, ‘marginal workers’, ‘non-workers’, and ‘seeking/available for work’. For the present study leaving the categories ‘seeking/available for work’ and ‘non-workers’, we combine the rest of the categories for the calculation of the working population. The Census of India does not provide morbidity data; though, the disability data by their types, age groups, and genders for all the areas of India at the state level are available. So, for the factor health, disability data were taken from the Census of India. Thus, to decompose the change in the number of person-years with the healthy, literate, and working state, one must calculate separately the

values of healthy proportions, literate proportions, and working proportions by age and gender.

**V. RESULTS AND DISCUSSIONS**

The estimates of decomposition of the change in the number of person-years lived with healthy literate and working states are divided into two sections. In Section 1, the decomposition of sex differences in the healthy literate and working life years are evaluated for the period 2011. Section 2 gives the estimates for the periods 2001 and 2011 at the national and also at the state level for both the sexes separately. The estimated results of the decomposition of sex differences based on the 2011 census at the national and state level are presented in Table 1. Further, Tables 2 and 3 display the decomposition for the periods 2001 and 2011 for both males and females respectively. For our comparison, we have taken the aggregate values over all the ages (up to ages 70+) in Tables 1 to 3. Figure 1 displays the contributions of healthy, literate, working, and mortality effects of decomposition of the gender gap in healthy literate and working live years for 2011. Further, Figures 2 & 3 displays the corresponding contributions for the census years 2001 and 2011 for males and females respectively. It is worthwhile to mention that, in many applications, one of the factors will account for more than 100 percent of the original difference and this happens when the two factors work in opposite directions, and there is no reason to expect that they will normally work in concert [12].

*A. Section 1: Decomposition of the gender difference in 2011*

Decomposition of sex difference in the number of person-years lived with healthy, literate, and working state partitioned the differences into the contribution made by the differences in each effect separately. In the above context, we have considered males as population ‘2’ and females as population ‘1’. Further, a positive sign for the healthy effects, for instance, reflects an increase in the healthy literate and working life year of males that is due to an increase in the health condition of males than that of their female counterparts. Likewise, a positive sign for literacy effect and working effect signifies an increase that males lived in a more literate state and working state respectively than that of females. Moreover, a negative sign for mortality reflects a decline in the healthy literate and working life years of males that is due to an increase in the mortality rate of males than that of females.

Decomposition results showed that the contribution of the healthy effect, literacy effect, working and the mortality effects differed substantially during 2011.

TABLE 1: DECOMPOSITION OF MALES-FEMALES DIFFERENCE IN THE NUMBER OF PERSON-YEARS WITH HEALTHY, LITERATE, AND WORKING STATE OF INDIA AND ITS SELECTED STATES, 2011

<b>DECOMPOSITION OF MALES-FEMALES DIFFERENCE IN THE NUMBER OF PERSON-YEARS WITH HEALTHY, LITERATE AND WORKING STATE OF INDIA AND ITS SELECTED STATES, 2011</b>
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Country /State	Healthy effect	Literacy effect	Working effect	Mortality effect	$\Delta P_{hlwx}L_x$
India	-0.08	6.31	13.14	-0.54	18.83
Assam	-0.01	3.00	9.31	-0.24	12.05
Gujarat	-0.05	5.79	16.89	-0.75	21.87
Kerala	-0.11	1.08	23.67	-1.11	23.53
Odisha	-0.01	1.33	2.59	-0.07	3.83
Punjab	-0.02	0.63	4.16	-0.13	4.64
Uttar Pradesh	-0.07	7.46	13.28	-0.28	20.38

In India, the values in Table 1 depict the positive difference in the person-years lived with healthy literate and working states. It shows that in India, the male could expect to live a better life with a healthy literate and working condition as compared to females. It shows that the 18.83 extra healthy literate and working live years that males in India could expect to live compared to females were largely caused by the improvement in the working and literacy conditions of males than that of females during 2011. Almost 70% of the increases are due to the contribution of working while 34% by the literacy improvement of males. The improvement in the working conditions of males plays a significant role in these increases. On the other hand, the healthy and mortality effect contributes negatively i.e. yielded 0.08 and 0.5 fewer healthy literate and working life years respectively. On the contrary, it can be said that the healthy and mortality condition of females showed an advantage over males.

Likewise, all the selected states accomplished a positive difference in the healthy literate and working life years during 2011 (Table 1). It can be stated that males are spending the highest years of their life in a healthy literate and working state as compared to their female counterparts. This articulates the plight quality of life lived by the females in the respective states. Among the states, the highest difference has prevailed in Kerala with 23.53 years followed by Gujarat (21.88 years) and Uttar Pradesh (20.39 years) respectively. On the other hand, the lowest sex difference is observed in Odisha with 3.84 years. This can be said that the male population of Kerala, Gujarat, and Uttar Pradesh, are enjoying a better healthy literate and working life than that of other selected states. Furthermore, in Kerala, the working effect contributes 101% (23.67/23.53) and 5% are attributable to the improvement in the literacy states of males than that of females. Similarly, in Gujarat and Uttar Pradesh, the improvement in the working condition of males contributes 77% (15.56/19.77) and 65% (12.69/19.23) respectively towards these increases. We can say that the contribution of the improvement in the working condition of males plays a significant role in the gains in healthy literate and working life years as compared to their female counterparts. Further, Kerala is one of the most socio-economically affluent states with the highest literacy rates in India. However, the performance of the state doesn't seem satisfactory from the analysis of healthy literate working life of the females. This may be due to the low work participation rate among females in Kerala. Though Kerala ranks high on the indicators of demographic progress in terms of economy it has not experienced similar levels in terms of work participation particularly among females [10].

Moreover, a significant disparity is observed among the four contributing factors of all the selected states including

India. In all the selected states, comparing all the four factors it becomes apparent that an increase in the number of person-years lived with healthy literate and working states of males were driven primarily by increases in the employment condition along with the literacy condition of males as compared to that of females during 2011. This phenomenon could be explained by the fact that underreporting of work participation as most of the Indian women do unpaid household work [5]. Ghosh and Mukhopadhyay (1984) reported a drastic reduction in the number of female workers and their work participation rates and they explained this situation mainly in terms of the dominant position of the male in the workforce, the low level of overall employment, and the adverse sex-ratio of females in the population. In spite of the consistent increase in the level of education in India over the decades, the pace of increase is slow in the selected states, especially among females. These attributes may be the cause for lowering the value of healthy literate and working lives for females in all the selected states during the period under consideration.

Comparing the health scenario of all the selected states, it is reported that, healthy effect contributes negatively towards this increase. Thus we can say that females of all the selected states enjoying a healthier life as compared to males during 2011. In both developing and developed countries, awareness of the importance of gender analysis in health is growing, with respect to both infectious and chronic diseases [14]. This can be said that females tend to live longer than males in 2011. One striking feature is that though the improvement in the contribution of mortality is higher for females but in respect of education and employment status females are much lagging behind the males.

#### *B. Section 2: Decomposition of the difference among the periods 2001 and 2011*

In the above context of decomposition among the periods 2001 and 2011, we have considered the period. From Tables 2 and 3, we have seen that except Punjab females, the change in the number of person-years with healthy literate and working states has increased substantially in all the selected states along with India in both the sexes. In this respect, Indian males achieved an overall increase of 2.51 years between 2001 and 2011. About 77% (1.94/2.51) of this change is due to the improvement in literacy condition, 51% (1.28/2.51) by the mortality improvement, and 0.4% by the improvement in the health conditions of males. Whilst, the working conditions of males contribute negatively towards this increases. On the other hand, in the case of females, India achieved 6.28 years of increase in the healthy literate and working life years during 2001 and 2011 (refer to Table 3). Around 70% (4.38/6.28) of the increase was due to the improvement in working conditions, while 24% (1.5/6.28) and 6% (0.4/6.28) of this

increase was mainly due to the contribution of the improvement in the literacy and mortality condition of females respectively. From the above, it is worthwhile to mention that in India females are enjoying a better year of their life with a healthy literate and working state as compared to males during 2001 and 2011.

Among the selected states for males, Gujarat (3.49 years) achieved the highest increase in the number of person-years lived with healthy literate and working states and the lowest is found in Punjab with 1.67 years. In Gujarat, 71% of these increases are mainly attributable to the contribution of the increase in the literacy status of males during the concerned period, while the working and mortality effect contributes 1.1% and 30% of this increase. On the other hand, for female counterparts, Odisha performed the highest increase with 2.90 years and Punjab achieved a negative increase of -0.93 years in the number of person-years lived with the healthy literate and working states during 2001 and 2011 respectively. In Odisha, it has been observed that improvement in the literacy effect accounts for 73%, the working effect accounts for 10% and the mortality effects contribute 17% of the total increases during the concerned period. Thus, the improvement in the literacy condition of Odisha females accounts highest years to the

increase in the healthy literate and working life years during the period under consideration. On the contrary, in Punjab females, the person-years lived with a healthy literate and working states declined during the period under study. As expected, the literacy and the mortality improvement help to increase the changes but it is fully offset by the contribution of the working effect. Though Punjab has made strides of growth, high levels of development did not translate into the progress of women [6]. According to the primary census abstract of Punjab 2001 and 2011, the female work participation rate shows a declining trend in 2011 i.e. 19.1% in 2001 to 13.91% in 2011.

Comparing the health scenario of all the selected states it is observed that the contributions are much lower for both the sexes among all the factors. It is noteworthy to mention that the contribution of the improvement in the working status of India and its selected states are negligible in both the sexes during 2001 and 2011 respectively. Further, the selected state-wise estimate shows that the change in the healthy literate and working life year of females are much lower than their male counterparts during the period under consideration. This can be said that Indian females are spending fewer years of their life with healthy literate and working states in 2001 than that of 2011.

TABLE 2: DECOMPOSITION OF DIFFERENCE IN THE NUMBER OF PERSON-YEARS WITH HEALTHY, LITERATE AND WORKING STATE OF INDIA AND ITS SELECTED STATES, FOR 2011 AND 2001, MALES

DECOMPOSITION OF DIFFERENCE IN THE NUMBER OF PERSON-YEARS WITH HEALTHY, LITERATE AND WORKING STATE OF INDIA AND ITS SELECTED STATES, FOR 2011 AND 2001, MALES					
Country /State	Healthy effect	Literacy effect	Working effect	Mortality effect	$\Delta_i P_{hlwx}L_x$
India	0.01	1.94	-0.73	1.28	2.51
Assam	0.14	1.50	0.18	1.55	3.37
Gujarat	-0.04	2.47	0.04	1.03	3.49
Kerala	0.17	2.09	0.16	0.41	2.83
Odisha	-0.05	2.00	-0.33	1.68	3.30
Punjab	-0.16	2.36	-1.41	0.88	1.67
Uttar Pradesh	0.05	2.74	-0.88	1.12	3.03

TABLE 3: DECOMPOSITION OF DIFFERENCE IN THE NUMBER OF PERSON-YEARS WITH HEALTHY LITERATE AND THE WORKING STATE OF INDIA AND ITS SELECTED STATES, FOR 2011 AND 2001, FEMALES

DECOMPOSITION OF DIFFERENCE IN THE NUMBER OF PERSON-YEARS WITH HEALTHY, LITERATE AND WORKING STATE OF INDIA AND ITS SELECTED STATES, FOR 2011 AND 2001, FEMALES					
Country /State	Healthy effect	Literacy effect	Working effect	Mortality effect	$\Delta_i P_{hlwx}L_x$
India	-0.002	1.50	4.38	0.40	6.28
Assam	0.02	1.49	0.21	0.51	2.22
Gujarat	0.01	2.05	-1.76	0.34	0.64
Kerala	0.03	0.85	0.80	0.08	1.76
Odisha	-0.02	2.13	0.29	0.50	2.90
Punjab	-0.03	1.09	-2.29	0.32	-0.93
Uttar Pradesh	-0.004	1.60	-1.44	0.37	0.52

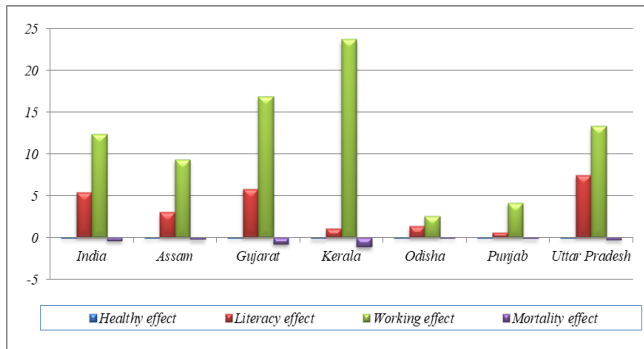


Fig. 1. Decomposition of the gender difference in healthy literate and working live years into healthy, literate, working and mortality effect in India and its selected states, 2011.

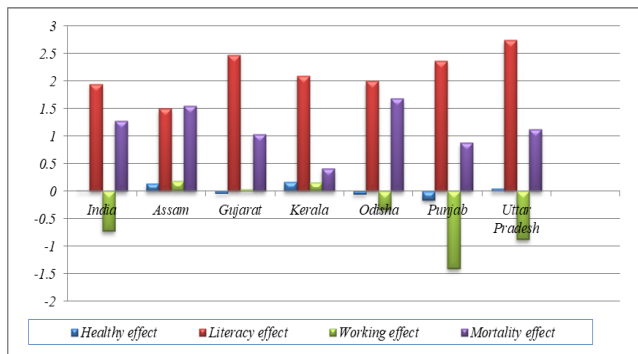


Fig. 2. Decomposition of healthy literate and working live years into healthy, literate, working and mortality effect for the periods 2001 and 2011 in India and its selected states, males.

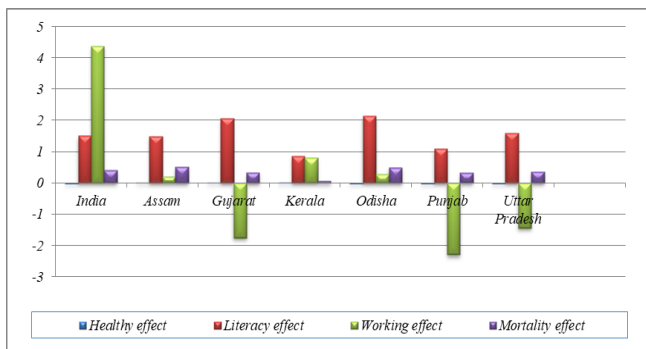


Fig. 3. Decomposition of healthy literate and working live years into healthy, literate, working and mortality effect for the periods 2001 and 2011 in India and its selected states, females.

**CONCLUSION**

Here, we have tried to analyze one of the most important indicators of the social and economic development of a country, the Healthy Literate Working Life Expectancy in terms of the number of person-years spent in healthy literate and working state and decomposing it further into the additive contributions of Healthy, Literate, Working and Mortality effect. The study was conducted to view the clear image of the social development situation in the context of India and its selected states. The analysis of the decomposition of the gender difference in India shows that males could expect to live a better life with a healthy literate and working condition as compared to that of females. This may be due to the

improvement in the employment and the literacy condition of males than that of females. The increase in the life expectancy of females has not translated fully into economically active years. The finding of the study highlights the importance of Government and Non-Government involvement towards the improvement of literacy and work force participation, especially among females.

Further, decomposition of the change in healthy literate and working life years between the period 2001 and 2011 showed that in India, females are enjoying a higher increase than that of males. Based on the findings of this study, the state scenario comprehensively depicts that Punjab should be highly focused in respect of healthy, literate, and working conditions especially among both the sexes. A paramount conclusion that emerged from the chapter is that the state Punjab portrays the issue of unemployment among both sexes. This should be considered as the greatest concern by the policy makers.

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