ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 11| Issue: 8| August 2025|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2025: 8.691 || ISI Value: 1.188

# GROWTH TRENDS IN BIRTH, DEATH AND INFANT MORTALITY IN HIMACHAL PRADESH

**Dr. Anil Kumar[1], Mr. Mukul Sharma[2]**
[1]*Ex. Research Investigator, Population Research Centre & Agro-Economic Research Centre, Himachal Pradesh University, Summer Hill, Shimla- 171005.*
[2]*Field Investigator, Population Research Centre, Himachal Pradesh University, Summer Hill, Shimla- 171005.*

**ABSTRACT**
*In the present study an attempt has been made to examine the growth trends in birth, death and infant mortality in Himachal Pradesh with the help of secondary data (2010-2020) by using the exponential growth function and the 't' test to determine the statistical significance of trends in birth, death, and infant mortality over the study period. The results shows that the birth rate in Himachal Pradesh has been decreasing during the years 2010 to 2020 with a CGR of -0.83 percent, per annum, while the death rate has increased with a CGR of 0.11 percent, per annum. Further, infant mortality rates in Himachal Pradesh during the study period have shown a steady decrease with a CGR -8.81 per cent, per annum, possibly due to improvements in healthcare facilities and awareness programs. This indicates progress in public health outcomes in Himachal Pradesh. The findings suggest that continued efforts are needed to sustain and improve these positive trends. The state's efforts in enhancing healthcare services and promoting health awareness among residents are crucial for the betterment of public health in Himachal Pradesh.*
**KEY WORDS:** *Growth, Birth, Death, Infant Mortality, Himachal Pradesh.*

## 1. INTRODUCTION

India, is the second most populated country at global level, and contributes 17.70 percent of the world's population. Its top three most populated states are Uttar Pradesh, Maharashtra, and Bihar, while Sikkim is the least populated state. Despite being the most populous country at global level, India's birth rate and growth rate surpass China in the coming years. India has a high birth rate (with 67,385 babies born daily), accounting for one-sixth of the world's total childbirth. The annual birth rate in India is one-fifth of the world's yearly childbirth, with approximately 25 million babies born annually. The crude birth rate is 17 births per 1000 persons. In India Bihar has the highest birth rate, followed by Uttar Pradesh, Madhya Pradesh, and Rajasthan respectively.

The mortality rate in India is 7.30 per 1000 persons, with approximately 26789 deaths reported daily. In 2019, India's Infant Mortality Rate (IMR) was 30 deaths per 1000 live births. The female mortality rate was 145.05 per 1000 female adults, while the male mortality rate was 201.4 per 1000 male adults. These statistics highlight the country's high mortality rates.

The birth and death rate in Himachal Pradesh (H.P) are important indicators of the state's population dynamics. By analyzing these rates, policymakers can better understand trends in population growth and mortality rates, which may helpful in forming public health and social welfare policies. Therefore, it is crucial to examine these rates to ensure sustainable development and well-being for the residents of Himachal Pradesh.

## 2. OBJECTIVES

i. To analyze and examine the growth trends in birth, death and infant mortality rates in Himachal Pradesh.
ii. To give a set of suggestions for further improvement in health indicators viz., birth, death, and infant mortality rates within Himachal Pradesh.

## 2. HYPOTHESIS

i. **Null ($H_0$):** There is no statistically difference in the growth trends in birth, death and infant mortality rates in Himachal Pradesh over the study period.
ii. **Alternate ($H_1$):** There is statistically difference in the growth trends in birth, death and infant mortality rates in Himachal Pradesh over the study period.

## 3. DATA SOURCE & RESEARCH METHODOLOGY

The present paper is based upon secondary data, which is compiled from the official website of the Directorate of Economics and Statistics, Government of Himachal Pradesh, i.e., https://himachalservices.nic.in for 11 years, i.e. 2010 to 2020. Further, data has been analyzed for growth trends in birth, death, and infant mortality in Himachal Pradesh with the help of the exponential growth function; the specification of this function is as follows:

$y = a * e^{(bx)}$

Where y represents the number of births/deaths, a is the initial value, and b is the growth rate. Furthermore, the 't' test has also been used to determine the statistical significance of these trends in birth, death, and infant mortality over the study period (2010–2020).

## 4. RESULTS AND DISCUSSION

### 4.1 Growth trends in birth and death rate in Himachal Pradesh

Table 1 presents the growth trends in birth and death rates in Himachal Pradesh, showing varying rates from 2010 to 2020.

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The birth rate per 1000 population was 16.9 in 2010, 16.5 in 2011, 16.2 in 2012, 16.0 in 2013, 16.4 in 2014, 16.3 in 2015, 16.0 in 2016, 15.8 in 2017, 15.7 in 2018, 15.4 in 2018 and 15.3 in 2020. On the other hand, death rate showed a slight increase over the same time period. Per 1000 population it was 6.9 in 2010, 6.7 during the years 2011to 2014, 6.6 in 2015, 6.8 in 2016, 6.6 in 2017, 6.9 in 2018, 6.9 in 2019, and 6.8 in 2020. The results further shows that the birth rate in Himachal Pradesh has been gradually decreasing over the years 2010 to 2020 with a compound growth rate (CGR) of -0.83 per cent, per annum. On the other hand, the death rate has remained relatively stable between the years 2010 to 2014. Overall during the study period (2010 to 2020) the death rate has been increased with compound growth rate (CGR) of 0.11 per cent, per annum.

**Table-1: Growth trends in Birth and Death Rate in Himachal Pradesh**

| Particulars | Birth Rate | Death Rate |
|---|---|---|
| 2010 | 16.9 | 6.9 |
| 2011 | 16.5 | 6.7 |
| 2012 | 16.2 | 6.7 |
| 2013 | 16.0 | 6.7 |
| 2014 | 16.4 | 6.7 |
| 2015 | 16.3 | 6.6 |
| 2016 | 16.0 | 6.8 |
| 2017 | 15.8 | 6.6 |
| 2018 | 15.7 | 6.9 |
| 2019 | 15.4 | 6.9 |
| **2020** | **15.3** | **6.8** |
| **CGR** | -0.83 | 0.11 |
| t Stat* | 9.9417 | 0.7541 |
| P(T<=t) one-tail | 0.0000 | 0.2341 |
| t Critical one-tail | 1.8125 | 1.8125 |

*= Significant 0.05 percent level of significance.

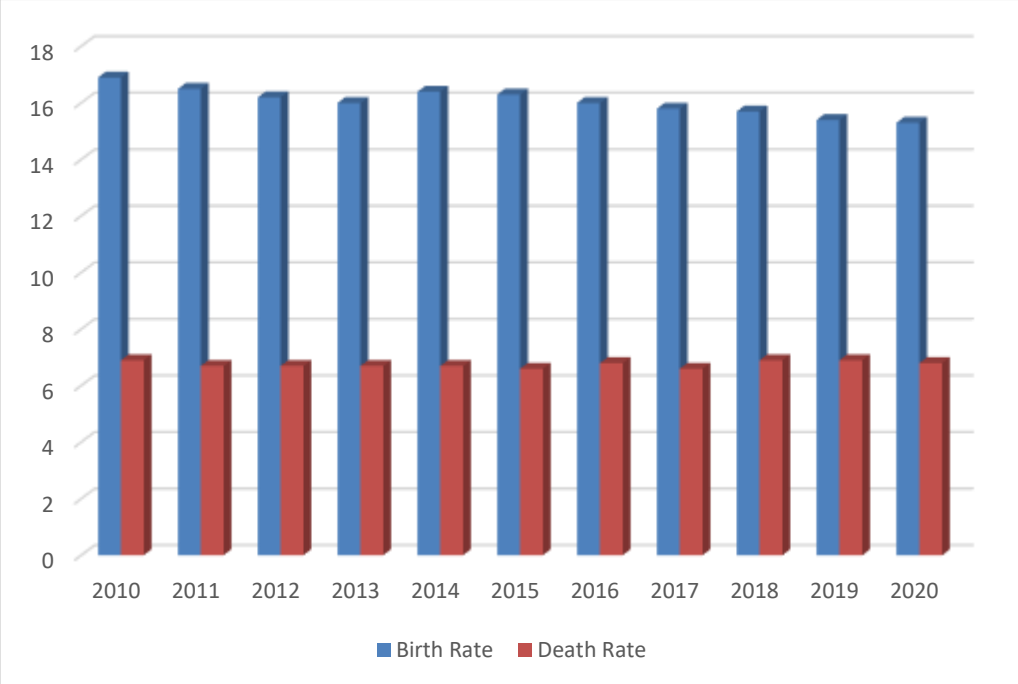



**Figure-1: Birth and Death Rate in Himachal Pradesh**

The value of 't' statistics is statistically significant in case of birth rate and whereas in death it non-significant at 0.05 percent level of significance. The value of 't' statistics confirms that there is no much difference in birth rate in Himachal Pradesh and there is difference death rate in Himachal Pradesh during the study period. This data suggests that the population growth rate is slowing down due to declining birth rates, the mortality rate has not shown significant changes in recent years. This trend may indicate a potential future decrease in population growth in Himachal Pradesh, if birth rates continue to decline.

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### 3.2 Growth trends in Infant Mortality Rates in Himachal Pradesh

In Table-2, the infant mortality rates in Himachal Pradesh have shown a steady decrease from 40 in 2010 to 17 in 2020, with a compound growth rate (CGR) of -8.81 percent, per annum. In comparison, the infant mortality rates at India level have also decreased from 47 in 2010 to 28 in 2020, with a CGR of -4.79 percent, per annum. This indicates that Himachal Pradesh has seen a more significant decrease in infant mortality rates compared to the national average over this time period. This could be attributed to various factors such as improved healthcare facilities, awareness programs, and government initiatives focused on maternal and child health. It is essential for other states to learn from Himachal Pradesh's success in reducing infant mortality rates to implement similar strategies for better outcomes nationwide.

**Table-2: Growth trends in Infant Mortality Rates in Himachal Pradesh and India**

| Particulars | Himachal Pradesh | All India |
|---|---|---|
| 2010 | 40 | 47 |
| 2011 | 38 | 44 |
| 2012 | 36 | 42 |
| 2013 | 35 | 40 |
| 2014 | 32 | 37 |
| 2015 | 28 | 37 |
| 2016 | 25 | 34 |
| 2017 | 22 | 33 |
| 2018 | 19 | 32 |
| 2019 | 19 | 30 |
| **2020** | **17** | **28** |
| **CGR** | -8.81 | -4.79 |
| t Stat* | 8.2069 | 14.8308 |
| P(T<=t) one-tail | 0.0000 | 0.0000 |
| t Critical one-tail | 1.7709 | 1.7459 |

*Source: i) SRS Bulletin, Registrar General of India.*
*ii) Health & Family Welfare Department, GoH.P.*
**= Significant at 0.05 percent level of significance.*

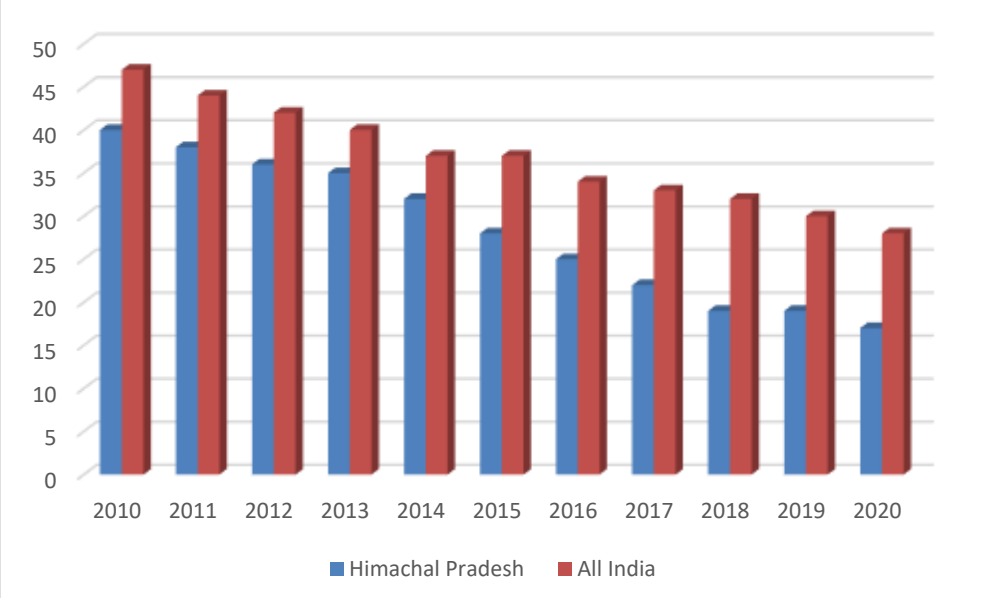



**Figure-2: Growth trends in Infant Mortality Rates in Himachal Pradesh and India**

The value of 't' statistics is statistically significant at the 0.05 percent level of significance in infant mortality during the study period in Himachal Pradesh and at the India level as well. This value confirms that there is a difference in infant mortality in Himachal and at the India level as well. This difference is statistically significant. Therefore, it can be concluded that Himachal Pradesh has a lower infant mortality rate as compared to the national average. This finding is important for policymakers and public health officials in Himachal Pradesh, as it indicates that the state's healthcare initiatives and interventions may be more effective in reducing infant mortality compared to the rest of India.

## 5. TESTING HYPOTHESIS

The value of 't' statistics is statistically significant in the case of birth rate and infant mortality rate, while in death rate it is

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non-significant at the 0.05 percent level of significance. Thus the null hypothesis in the case of birth and infant mortality rate has been rejected, and the alternate hypothesis has been accepted. Whereas among the death rate, the null hypothesis has been accepted and the alternate hypothesis has been rejected.

## 6. CONCLUSIONS AND SUGGESTIONS

From the above results and discussion it is found that the birth rate in Himachal Pradesh has been gradually decreasing over the years 2010 to 2020. On the other hand, the death rate has remained relatively stable during the years 2010 and 2014. Overall during the study period (2010 to 2020), the death rate has increased. The infant mortality rates in Himachal Pradesh have shown a steady decrease during the study period. This could be attributed to advancements in healthcare facilities and awareness programs in the state. It is encouraging to see improvements in infant mortality rates and life expectancy, indicating progress in overall public health outcomes in Himachal Pradesh. The findings suggest that continued efforts should be made to sustain and further improve these positive trends in the future. The results indicate a promising trend of decreasing infant mortality rates in Himachal Pradesh, coupled with a steady increase in life expectancy. These positive outcomes may be linked to the state's efforts in enhancing healthcare services and promoting health awareness among its residents. It is crucial for policymakers and healthcare providers to continue their initiatives to maintain and build upon these advancements for the betterment of public health in Himachal Pradesh. The findings highlight the importance of ongoing efforts to sustain and further improve the health outcomes of individuals in the state.

## REFERENCES

1. *Dandona R, et. al (2019). Distinct mortality patterns at 0–2 days versus the remaining neonatal period: results from population-based assessment in the Indian state of Bihar. BMC medicine. 17(1),140.*
2. *Gogoi, M. (2018). Family Planning and Socio-Economic Dynamics: A Study among Boro Kachari Tribe of Assam. International Journal of Current Trends in Science and Technology, 8(4), 81-90.*
3. *Leibenstein, H. (1974). An interpretation of the Economic theory of fertility. Journal of Economic Literature, 12 (2), 457-479.*
4. *Malthus, T. (1826). An essay on the Principle of Population. London: J Johnson.*
5. *Mari Bhat and Zavier (2003) Fertility Decline and Gender Bias in Northeast India, Demography, 40(4).*
6. *Mazumder, M. N., & Mukherjee, S. (2018). Level and Differentials of Fertility among Karbis of Kamrup Metropolis, Assam. Studies of Tribes and Tribals, 16(1/2), 24-32.*
7. *Murphy, M., & Knudsen, L. (2002). The intergenerational Transmission of fertility in Contemporary Denmark: The Effects of Number of Siblings (Full and Half), Birth Order and Whether Male or Female. Population Studies, 56(3), 235-248.*
8. *Nagadeve, D. A., & Dongardive, P. B. (2021). Fertility and Family Planning Differentials among Social Groups in India. Demography India, 50(1), 1-16.*
9. *National Family Health Survey-1. (1992-93). IIPS, Ministry of Health & Family Welfare, Govt. of India, Mumbai.*
10. *National Family Health Survey-2. (1998-99). IIPS, Ministry of Health & Family Welfare, Govt. of India, Mumbai.*
11. *National Family Health Survey-3. (2005-06). IIPS, Ministry of Health & Family Welfare, Govt. of India, Mumbai.*
12. *National Family Health Survey-4. (2015-16). IIPS, Ministry of Health and family welfare, Govt. of India, Mumbai.*
13. *National Family Health Survey-5. (2019-21). IIPS, Ministry of Health & Family Welfare, Govt. of India, Mumbai.*
14. *Prabhakaran D. et. al (2018). The changing patterns of cardiovascular diseases and their risk factors in the states of India: the Global Burden of Disease Study 1990–2016. The Lancet Global Health. 6(12), 1339-51.*
15. *Prabu D. et. al (2018). Dental manpower in Tamilnadu state, India and its implications- A systematic trend analysis. International Journal of Current Research, 10(8), 72713-18.*
16. *Statistical Abstract of Himachal Pradesh 2021-22. Department of Economics and Statistics, Government of Himachal Pradesh, Shimla.*
17. *V. V, Sindhu. R et.al (2021). Trend analysis of vital statistics in India - a key to improve quality of health care services and infrastructure. International Journal of Research and Review. 8(11), 217-226.*