
Social Sector Health Expenditures and Inter-state Disparities in India: A Multi-indicator Analysis

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doi.org/10.51505/IJEBMR.2026.10805 URL: <https://doi.org/10.51505/IJEBMR.2026.10805>

Received: Jun 022, 2026

Accepted: July 01, 2026

Online Published: Aug 11, 2026

Abstract

The present paper studies performance of Social Sector Expenditures on Health (SSEH) using state level data for 24 states from 1990-91 to 2019-20. The relative position and relative performance of the states for SSEH are studied. States' ranking in the first year.e. 1990-91 and last year i.e. 2019-20 of the sample period and growth rate in 2019-20 w.r.t. 1990-91 are calculated for each state to comprehend the states' relative position. Along with it, states' decadal growth is studied by calculating CAGR for each of the three decades. The relative performance of the individual states compared to all states for SSEH are also studied. Three indicators are in use for capturing SSEH such as social sector expenditures on health as a percentage of Gross State Domestic Product (GSDP) (SSEH1), social sector expenditures (SSE) on health as a percentage of SSE (SSEH2) and Per-Capita social sector expenditures on health (SSEH3). Results of states' relative position suggests that for SSEH1, from 1990-91 to 2019-20 maximum states' rank increased. Out of 24 states 13 states rank increased and 10 states rank decreased. In case of SSEH2, maximum number of states' rank increased. Out of 24 states, 12 states' rank increased and 10 states' rank decreased. In case of SSEH3, it is found that maximum states' rank decreased. Out of 24 states 10 states rank increased and 12 states rank decreased. The result of states' relative performance points out that for SSEH1, 8 states are good performing states and 16 states are bad performing; for SSEH2, 11 states are good performing and 13 states are bad performing; for SSEH3, 8 states are good performing and 16 states are bad performing one. So, for SSEH2, maximum number of states i.e. 12 states are found to be good performing.

Keywords: Social Sector Expenditures on Health, Growth, Indian States, Different indicators, Disparity

Introduction

India's economic growth has been accompanied by a strong emphasis on social sector development to ensure inclusive progress and welfare for all citizens. Increasing attention to social sector contributes significantly and effectively to economic growth by providing healthy, educated and skilled workforce. Total health expenditure was Rs 4,83,259 crore in 2014-15,

which in 2019-20 has risen to Rs 6,55,822 crore (NHA, 2023). According to NHA estimates 2016-17, states account for 68.1% of all Government Health Expenditure (GHE) in India. Delhi used up Rs 2,938 in 2019-20 from Rs 1,367 in 2010-11; for Chhattisgarh it is Rs 288 to Rs 1,751; Odisha from Rs 252 to Rs 1,424; for Haryana from Rs 384 to Rs 1,733; Uttar Pradesh spending hiked to Rs 696 from Rs 689 (CEDA Report, 2021). So, it is motivating to look at the performance of Social Sector Expenditures on Health (SSEH) across Indian states.

The literature review relating to SSEH points out variety of works linking to various issues of SSEH. Rahman (2008) examines the public HE in India. The primary determinants influencing public health spending between 1971 and 1991 are explained using panel data model. Structural variable like percentage of the state population over 60, the population per primary health care facility and the population per doctor are statistically insignificant. Health care is not considered a luxury good, as indicated by an income elasticity of 0.47. Rao and Choudhury (2008) explain the basic healthcare facilities is crucial for empowering people with capabilities and freedoms, which are vital for development of health status of the population. However, public health infrastructure is poor and skewed towards more affluent states, leading to a lack of access and high costs for poor. The Twelfth Finance commission and Indian government have introduced equalisation schemes to highlight the inadequacy and uneven spread of health infrastructure. However, their adequacy and design leave much to be desired. Their aims to develop an equalisation scheme that address the adequacy and spread of health facilities by estimating expenditure needs using alternative approaches. The estimates suggest that GE on health in the country should be raised to at least 2.2% of GDP, with additional requirements for urban areas excluded. The overall requirement masks inter-state disparities in expenditure requirement for the health sector, with low-income states having higher expenditure requirements than other states. Purohit (2014) analyses the efficiency of SSE in India, focusing on E & H to access efficiency across major states. Hooda (2016) investigates the stimulus of political factors and fiscal capacity on HE in India. Results displays that political participation and diverse population representation lead to improved government health spending, indicating state interventionism. The government's desire for increased spending depends on financial resources, and the elasticity of health expenditure is less than 1.

Sudhakara and Prasad (2016) despite significant budget allocations for health sector improvement, high mortality rates persist, and the increasing population necessitates increased health facilities. The state is advised to develop a comprehensive plan to address healthcare challenges, which are vital for human development. Loganathan et al., (2017) study Wardha district of Maharashtra in India, found that 18.9% of households had catastrophic health expenditure over a year. OOP spending accounted for 69.5% of HE, exacerbated poverty and increased the risk of vulnerable groups falling into poverty. The study found that 81.9% of families had enough money while 15% borrowed money and 1.1% sold assets. They found that people with no healthcare facility in their village had higher odds of having catastrophic health expenditure. Mohanty and Behara (2020) inspects the stimulus of HE on health outcomes in 28 Indian states from 2005-2016. Results display that per capita expenditure negatively impacts infant and child mortality rates, malaria cases, and life expectancy, while positively impacts life

expectancy and immunization coverage. The study is relevant for achieving SDGs and universal health coverage. Ram and Kumar (2021) the study investigates the reasons of health expenditure in the Eastern region. Results show that household heads aged 31-60, larger households, non-ST categories, urban dwellers, higher economic status, private hospitals, and chronic illness members contribute more to healthcare spending. Female household heads are less probable to incur healthcare expenditure. The majority visit private hospitals, burdening vulnerable sections financially. Policy suggestions are proposed to address these issues. Sriram and Albadrani (2022) showed that poorer households had higher odds of CHE, particularly among those with children under healthcare facilities. They suggest expanding health insurance coverage. Ali and Dekaraja (2024) explain that expenditure on health is essential to improve labour productivity and life expectancy in India.

There is dearth in the study regarding state level study and specifically the analysis of SSEH. Thus, the main objectives in this paper are twofold: (I) to examine the relative position of the Indian states for SSEH and (II) to analyse the relative performance of the individual states compared to all states for SSEH.

Methodology and Data

Methodology

Three indicators are taken for capturing SSEH such as social sector expenditures on health as a percentage of GSDP (SSEH1), social sector expenditures (SSE) on health as a percentage of SSE (SSEH2) and Per-Capita social sector expenditures on health (SSEH3).

For finding out states' relative position in the first sample year i.e. 1990-91 and last sample year i.e. 2019-20 of the sample periods, ranks are assigned to all the states based on the fact that the state incurring maximum expenditures are assigned rank 1 and vice versa for all the indicators of SSEH considered. Also Compound Annual Growth Rates (CAGR) in 2019-20 w.r.t. 1990-91 are calculated for each state to understand the states' relative position.

Along with it, states' decadal growth is studied by calculating CAGR for each decade. The total sample period is divided into 3 decades; first decade (D1) covers 1990-91 to 1999-20, second decade (D2) covers 2000-01 to 2009-10 and 2010-11 to 2019-20 are covered under third decade (D3). CAGR for each state for D1, D2 and D3 are compared for all the indicators of SSEH for understanding the relative position of the sample states in the three decades.

The relative performance of the individual states compared to all states for SSEH are studied. For doing that each state's average SSEH and their respective grand mean (GM) i.e. all states' average SSEH are calculated. Then each state's relative performance is determined by comparing each state's average SSEH with all states' average SSEH (grand mean, GM) as the case may be. Good performing states are those whose average SSEH > GM whereas bad performing states are those states having average SSEH < GM.

Data

The present study used secondary time series data during 1990-91 to 2019-20. The variables used are GSDP at constant price, base at 2004-05, NSDP at constant price, base at 2004-05, Expenditure on Medical and public health and Total Population.

The data are collected from various issues of State Finances: A Study of Budgets, Handbook of Statistics on the Indian Economy, Reserve Bank of India Bulletin, National Accounts Statistics, Population Projections for India and States, and Economic survey of India. Based on data availability, 24 states of India are considered like Andhra Pradesh (AP), Arunachal Pradesh (AR), Assam (AS), Bihar (BH), Goa (GO), Gujarat (GJ), Haryana (HR), Himachal Pradesh (HP), Karnataka (KA), Kerala (KL), Madhya Pradesh (MP), Maharashtra (MH), Manipur (MN), Meghalaya (ML), Mizoram (MZ), Nagaland (NL), Odisha (OD), Punjab (PB), Rajasthan (RJ), Sikkim (SK), Tamil Nadu (TN), Tripura (TR), Uttar Pradesh (UP) and West Bengal (WB). Other states Union Territories could not be considered due to data unavailability during the sample period.

Result of Analysis of SSEH

In this section, relative position as well as relative performance of the 24 states for social sector expenditures on health is presented for the three indicators SSEH1, SSEH2 and SSEH3. States' ranking in 1990-91 and 2019-20 of the sample period and CAGR in 2019-20 w.r.t. 1990-91 are calculated for each states to recognize the states' relative position. Along with it, states' decadal growth is studied by calculating CAGR for each of the three decades. The relative performance of the individual states compared to all states for SSEH are studied.

Results of relative position of the states in terms of SSEH

The relative position of the states in terms of SSEH1, SSEH2 and SSEH3 in 1990-91 and 2019-20 is presented in Table 1 below:

Table 1: Relative position of the states in terms of SSEH

State	SSEH1			SSEH2			SSEH3		
	Rank in 1990-91	Rank in 2019-20	CAGR	Rank in 1990-91	Rank in 2019-20	CAGR	Rank in 1990-91	Rank in 2019-20	CAGR
AP	9	17	-0.94%	18	20	-1.53%	20	22	9.05%
AR	3	1	5.98%	11	1	1.71%	4	1	13.98%
AS	17	6	4.38%	19	9	-0.22%	19	9	12.61%
BH	15	12	1.90%	8	23	-2.98%	24	23	9.76%
GO	12	16	0.36%	4	3	-0.07%	7	8	10.52%
GJ	21	24	-0.71%	14	15	-1.12%	15	20	9.98%
HR	24	21	2.34%	21	14	-0.52%	18	12	11.85%
HP	7	8	0.67%	2	7	-1.14%	5	6	10.41%

KA	20	19	0.77%	6	16	-1.45%	17	15	10.91%
KL	10	15	0.77%	5	2	0.28%	11	10	11.16%
MP	19	11	2.46%	20	11	-0.29%	23	19	11.43%
MH	23	23	0.96%	15	18	-1.47%	14	18	10.08%
MN	8	4	2.95%	17	13	-0.88%	9	7	11.49%
ML	4	3	2.21%	10	5	0.10%	6	4	11.91%
MZ	11	2	4.71%	23	10	0.23%	1	3	10.76%
NL	2	5	0.23%	13	6	0.10%	3	5	9.26%
OD	18	9	2.60%	16	17	-1.23%	22	13	11.91%
PB	22	18	1.26%	1	4	-0.65%	10	17	9.29%
RJ	13	10	1.98%	24	24	1.98%	16	16	10.63%
SK	6	7	1.11%	9	8	-0.51%	2	2	11.63%
TN	14	22	-0.40%	12	12	-0.94%	12	14	10.17%
TR	5	13	-0.89%	22	21	-1.12%	8	11	9.69%
UP	16	14	1.55%	7	19	-1.78%	21	24	8.87%
WB	1	20	-4.41%	3	22	-2.46%	13	21	8.74%

For SSEH1, it is found that in 1990-91 West Bengal was in 1st position and Nagaland take 24th position. But in 2019-20 it is found that Arunachal Pradesh takes 1st position whereas Mizoram takes 24th place for SSEH1. For SSEH1 from 1990-91 to 2019-20 maximum states' rank increased. Out of 24 states 13 states rank increased and 10 states rank decreased. But one state i.e., Maharashtra has no change in his rank. It remains unchanged.

For SSEH2, it is found that in 1990-91 Punjab was in 1st position and Rajasthan take 24th position. But in 2019-20 it is found that Arunachal Pradesh takes 1st position whereas Rajasthan takes 24th place for SSEH2. For SSEH2 from 1990-91 to 2019-20 maximum number of states' rank increased. Out of 24 states 12 states rank is increase and 10 states rank decrease. But two states i.e., Rajasthan and Tamil Nadu has no change in their rank. They remain unchanged.

In case of SSEH3, it is found that in 1990-91 Mizoram was in 1st position and Bihar take 24th position. But in 2019-20 it is found that Arunachal Pradesh takes 1st position whereas Uttar Pradesh takes 24th place for SSEH3. For SSEH3 from 1990-91 to 2019-20 maximum states' rank decreased. Out of 24 states 10 states rank is increase and 12 states rank decrease. But two states i.e., Rajasthan and Sikkim has no change in their rank. They remain unchanged.

For SSEH1, SSEH2 and SSEH3, the CAGR of 2019-20 w.r.t. 1990-91 are computed which shows maximum growth for AR and minimum for West Bengal considering SSEH1 whereas it is Bihar and Rajasthan for SSEH2 and for SSEH3, it is again Arunachal Pradesh and WB respectively. States' growth rates are also presented graphically in the Figure 1 considering SSEH1, SSEH2 and SSEH3.

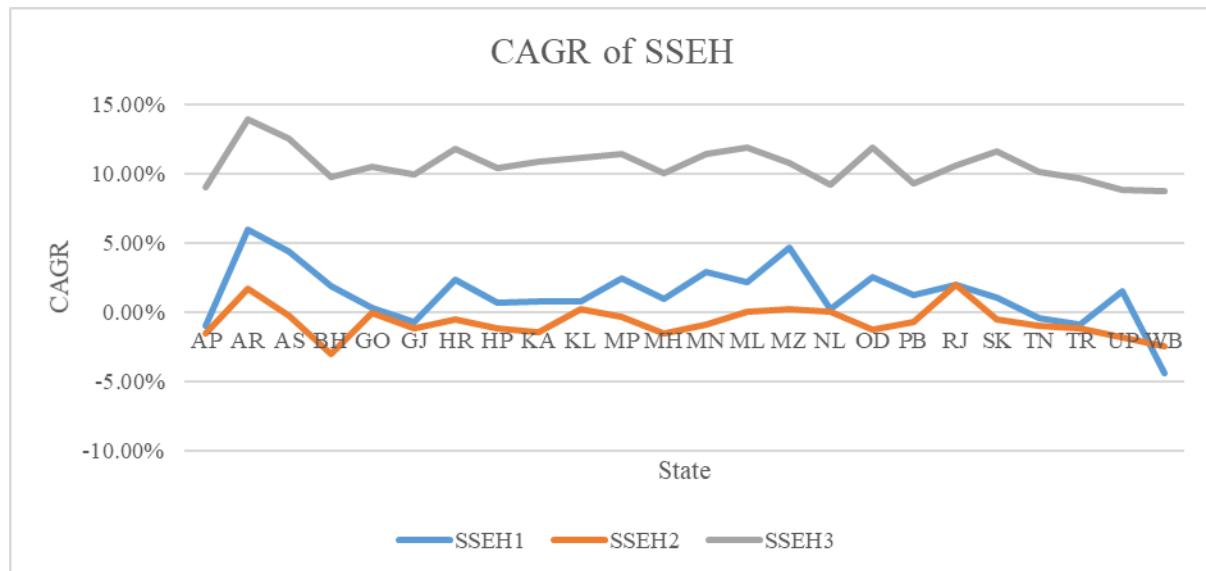


Figure 1: Growth rate of the states for SSEH1, SSEH2 and SSEH3

Decadal growth rate of SSEH in the sample states

Now it is interesting to see the changes of the state's growth of SSEH in three decades, D1, D2 and D3. The growth rate varied among three decades. The decadal growth of SSEH of the sample states for SSEH1, SSEH2 and SSEH3 are presented in Table 2.

Table 2: Decadal growth of the states in terms of SSEH

State	SSEH1			SSEH2			SSEH3		
	CAGR in D1	CAGR in D2	CAGR in D3	CAGR in D1	CAGR in D2	CAGR in D3	CAGR in D1	CAGR in D2	CAGR in D3
AP	-2.70%	1.78%	-0.39%	-0.64%	0.09%	-0.62%	2.85%	3.52%	1.56%
AR	-0.96%	1.82%	6.35%	0.30%	-1.42%	2.85%	3.13%	3.97%	7.33%
AS	-2.22%	3.99%	2.26%	-0.66%	1.81%	-1.10%	2.28%	5.11%	4.13%
BH	0.00%	0.61%	2.12%	-1.17%	-0.66%	-1.44%	2.80%	2.02%	4.41%
GO	-2.07%	1.38%	0.06%	0.25%	-0.45%	-0.45%	4.90%	1.79%	2.40%
GJ	-2.24%	-0.87%	1.79%	-0.63%	-0.85%	1.08%	3.30%	1.61%	4.09%
HR	-1.72%	1.65%	2.37%	-0.39%	-0.34%	0.64%	2.94%	3.70%	4.34%
HP	-1.98%	0.27%	2.11%	-0.71%	-0.62%	0.55%	3.06%	2.30%	3.90%
KA	-2.44%	0.72%	2.15%	-0.73%	-1.30%	0.61%	3.20%	2.36%	4.29%
KL	-2.57%	0.76%	2.39%	-0.97%	0.24%	0.73%	3.12%	2.82%	4.29%
MP	-1.61%	0.35%	3.34%	-0.49%	-0.79%	1.43%	2.96%	2.18%	5.43%
MH	-2.42%	0.05%	2.55%	-0.86%	-1.22%	0.52%	2.70%	2.06%	4.03%
MN	-1.08%	0.67%	2.22%	-0.31%	-1.66%	-0.02%	3.60%	2.25%	4.30%
ML	-2.81%	1.38%	3.81%	-0.51%	0.47%	0.97%	2.44%	3.12%	5.62%
MZ	1.88%	3.26%	2.29%	0.04%	1.99%	0.56%	3.26%	5.26%	4.07%

NL	-3.45%	-0.26%	2.90%	-0.33%	-0.36%	0.50%	1.68%	1.26%	4.27%
OD	-2.09%	1.62%	3.19%	-1.74%	0.25%	0.17%	2.76%	3.72%	4.91%
PB	-1.50%	-0.37%	2.15%	0.22%	-0.67%	0.19%	3.19%	0.95%	3.60%
RJ	-2.28%	1.53%	2.60%	-2.28%	1.53%	2.60%	2.76%	3.05%	4.08%
SK	-0.18%	-0.07%	1.55%	-0.33%	-0.52%	0.37%	3.40%	3.74%	3.80%
TN	-2.85%	0.96%	1.45%	-0.51%	-0.57%	0.45%	2.82%	3.18%	3.43%
TR	-3.46%	1.07%	1.22%	-1.38%	0.53%	-0.62%	1.35%	3.44%	3.75%
UP	-2.95%	2.59%	1.68%	-1.25%	-0.29%	-0.51%	1.15%	3.78%	3.13%
WB	-6.71%	0.58%	1.41%	-0.98%	-1.03%	-0.80%	2.50%	2.19%	3.11%

In all the three decades, the states' growth rates are fluctuating but not only that it shows negative values for some sample states excepting SSEH3.

For SSEH1, during D1, highest and lowest growth rate are found for Mizoram and WB respectively. In D2, they are Assam and Gujarat. During D3, highest and lowest growth rate are found for AR and AP respectively.

For SSEH2, during D1, highest and lowest growth rate are found for the states like Arunachal Pradesh and Rajasthan respectively. In D2, they are MZ and MN. During D3, maximum and minimum growth rate are found for AR and BH respectively. So in D1 and D3, the maximum growth state is found to be Arunachal Pradesh.

For SSEH3, during D1, maximum and minimum growth rate are found for GO and UP respectively. In D2, they are MZ and PB. During D3, maximum and minimum growth rate are found for AR and AP respectively.

Now we can compare this decade wise change in growth of the 24 major states based on three alternative indicators. Comparing SSEH1, SSEH2 and SSH3, the highest growth state is found in Arunachal Pradesh during D3 for SSEH1 and D1 and D3 for SSEH2 and D3 for SSEH3. The minimum growth rate during D3 is AP for SSEH1 and SSEH3. MZ is found to be of maximum growth for D1 considering SSEH1 and during D2 for both SSEH2 and SSEH3.

The states' decadal growth rates are also presented graphically in the Figures 2, 3, and 4 considering SSEH1, SSEH2 and SSEH3 respectively.

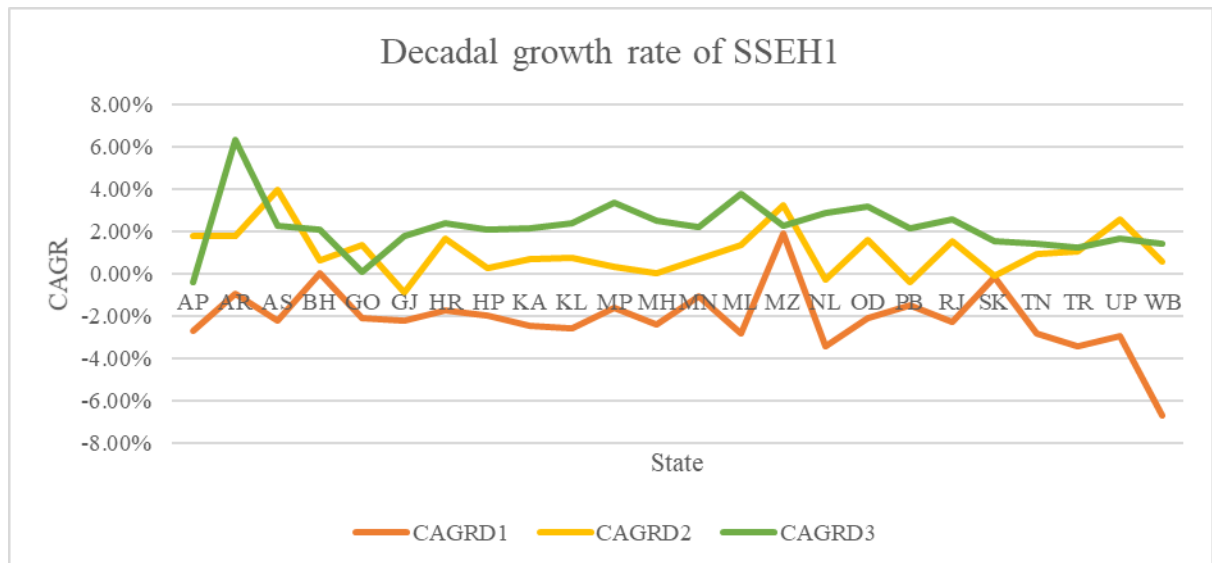


Figure 2: Decadal Growth rate of the states for SSEH1

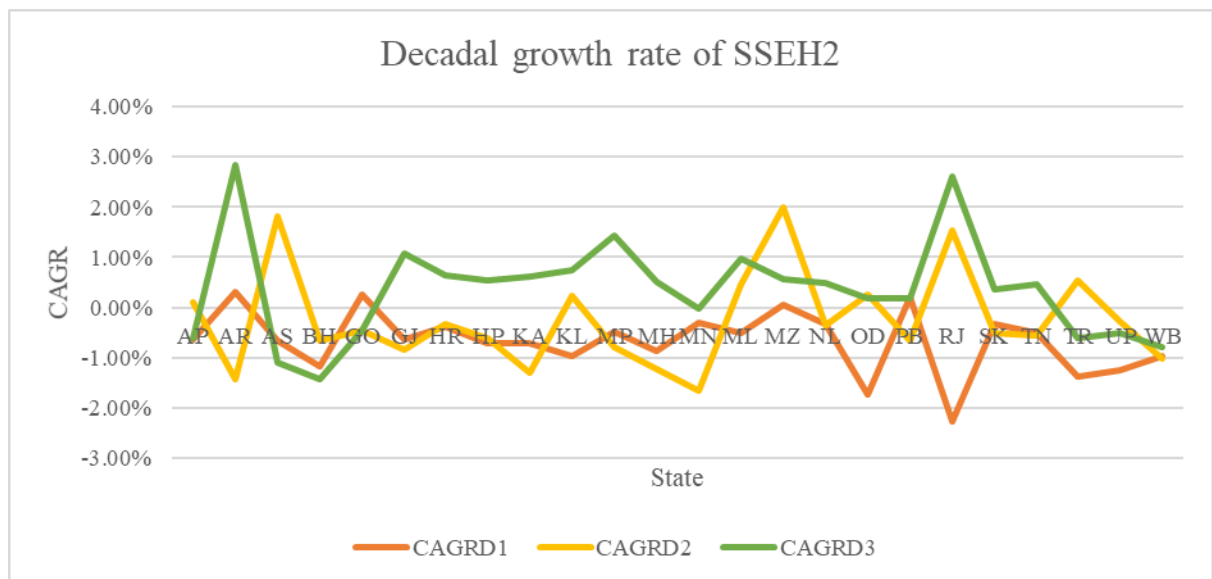


Figure 3: Decadal Growth rate of the states for SSEH2

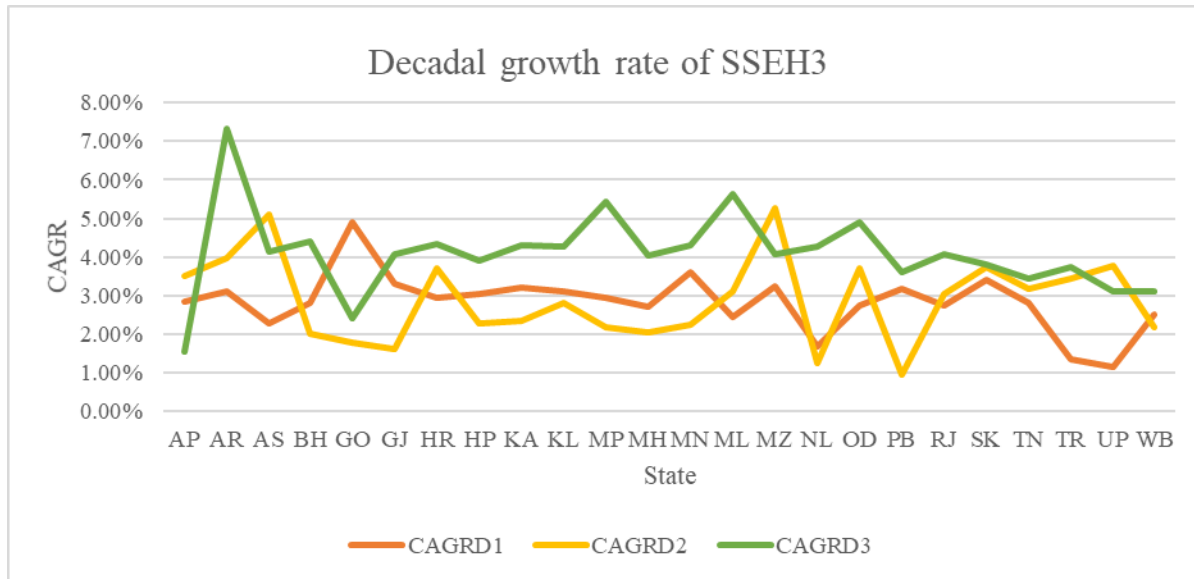


Figure 4: Decadal Growth rate of the states for SSEH3

Results of relative performance of the states in terms of SSEH

The results of states' relative performance for SSEH1, SSEH2 and SSEH3 are presented in Table 3.

For SSEH1, 8 states are good performing states and 16 states are bad performing states. For SSEH2, 11 states are good performing states and 13 states are bad performing states.

For SSEH3, 8 states are good performing states and 16 states are bad performing states.

So for SSEH2, maximum number of states i.e. 12 states are found to be good performing compared to SSEH1 and SSEH3.

Table 3: Relative Performance of the States in terms of SSEH

	Good Performing States	Bad Performing States
SSEH1	AR, AS, HP, MN, ML, MZ, NL, SK	AP, BH, GO, GJ, HR, KA, KL, MP, MH, OD, PB, RJ, TN, TR, UP, WB
SSEH2	AR, AS, GO, HP, KL, ML, MZ, NL, PB, SK, WB	AP, BH, GJ, HR, KA, MP, MH, MN, OD, RJ, TN, TR, UP
SSEH3	AR, GO, HP, MN, ML, MZ, NL, SK	AP, AS, BH, GJ, HR, KA, KL, MP, MH, OD, PB, RJ, TN, TR, UP, WB

Conclusion

The present paper studies performance of SSEH using state level data for 24 states from 1990-91 to 2019-20. Here we considered 24 states of India like AP, AR, AS, BH, GO, GJ, HR, HP, KA, KL, MP, MH, MA, ME, MZ, NL, OD, PB, RJ, SK, TN, TR, UP and WB.

The relative position and relative performance of the 24 states for SSEH are studied. States' ranking of the states in the first year, i.e. 1990-91 and last year i.e. 2019-20 of the sample period and CAGR in 2019-20 w.r.t. 1990-91 are calculated for each state to comprehend the states' relative position. Along with it, states' decadal growth is studied by calculating CAGR for each of the three decades. The relative performance of the individual states compared to all states for SSEH are also studied. Three indicators are in use for capturing SSEH such as SSEH1, SSEH2 and SSEH3.

Results of states' relative position for SSEH suggests that for SSEH1, it is found that in 1990-91 West Bengal was in 1st position and Nagaland took 24th position. But in 2019-20 it is found that Arunachal Pradesh takes 1st position whereas Mizoram takes 24th place for SSEH1. For SSEH1 from 1990-91 to 2019-20 maximum states' rank increased. Out of 24 states 13 states rank increased and 10 states rank decreased. But one state i.e., Maharashtra has no change in its rank. It remains unchanged. In case of SSEH2, it is found that in 1990-91 Punjab was in 1st position and Rajasthan took 24th position. But in 2019-20 it is found that Arunachal Pradesh takes 1st position whereas Rajasthan takes 24th place for SSEH2. For SSEH2 from 1990-91 to 2019-20 maximum number of states' rank increased. Out of 24 states 12 states rank is increase and 10 states rank decrease. But two states i.e., Rajasthan and Tamil Nadu has no change in their rank. They remain unchanged. In case of SSEH3, it is found that in 1990-91 Mizoram was in 1st position and Bihar took 24th position. But in 2019-20 it is found that Arunachal Pradesh takes 1st position whereas Uttar Pradesh takes 24th place for SSEH3. For SSEH3 from 1990-91 to 2019-20 maximum states' rank decreased. Out of 24 states 10 states rank is increase and 12 states rank decrease. But two states i.e., Rajasthan and Sikkim has no change in their rank. They remain unchanged.

For SSEH1, SSEH2 and SSEH3, the CAGR of 2019-20 w.r.t. 1990-91 are computed which shows maximum growth for AR and minimum for West Bengal for SSEH1 whereas it is Bihar and Rajasthan for SSEH2 and for SSEH3, it is again Arunachal Pradesh and WB respectively. States' decadal growth rate of SSEH indicates that in D1, D2 and D3, the states' growth rates are fluctuating but not only that it shows negative values for some sample states excepting SSEH3. For SSEH1, during D1, maximum and minimum growth rate are found for Mizoram and WB respectively. In D2, they are Assam and Gujarat. During D3, maximum and minimum growth rate are found for Arunachal Pradesh and Andhra Pradesh respectively. For SSEH2, during D1, maximum and minimum growth rate are found for Arunachal Pradesh and Rajasthan respectively. In D2, they are MZ and MN. During D3, maximum and minimum growth rate are found for AR and BH respectively. So in D1 and D3, the highest growth state is found to be Arunachal Pradesh. In case of SSEH3, during D1, maximum and minimum growth rate are found for the states like GO and UP respectively. In D2, the states are MZ and PB. During D3, maximum and minimum growth rate are found for AR and AP respectively.

Now we can compare this decade wise change in growth of the 24 major states based on three alternative indicators. Comparing SSEH1, SSEH2 and SSH3, the maximum growth state is found in Arunachal Pradesh during D3 for SSEH1 and D1 and D3 for SSEH2 and D3 for

SSEH3. The minimum growth rate during D3 is AP for SSEH1 and SSEH3. MZ is found to be of maximum growth for D1 in case of SSEH1 and during D2 for both SSEH2 and SSEH3.

The result of states' relative performance points out that for SSEH1, 8 states are good performing states and 16 states are bad performing states. For SSEH2, 11 states are good performing states and 13 states are bad performing states. For SSEH3, 8 states are good performing states and 16 states are bad performing states. So, for SSEH2, maximum number of states i.e. 12 states are found to be good performing.

References

- Ali. I. and Dekaraja, D. (2024). Public Health Expenditure and Gross State Domestic Product in India: A Regression Analysis. Asian Journal of Advanced Research and Reports, Volume 18, Issue 10, Page 164-171, 2024; Article no. AJARR.122543 ISSN: 2582- 3248.
- Chakraborty, C. and Maity, A. (2023), "Social Sector Expenditures on Education and HDI: Evidence from Selected Indian States", Das, R.C. (Ed.) Inclusive Developments Through Socio-economic Indicators: New Theoretical and Empirical Insights, Emerald Publishing Limited, Bingley, pp. 245-254.
- Hooda, S. K., (2016). 'Determinants of Public Expenditure on Health in India: A Panel Data Analysis at Sub-National Level', Journal of Quantitative Economics ISSN 0971- 1554, Volume 14, Number 2, J. Quant. Econ. (2016) 14:257-282, DOI 10.1007/s40953-016-0033-8.
- Loganathan, K., Deshmukh, P. R. and Raut, A. V. (2017). "Socio-demographic determinants of out-of-pocket health expenditure in a rural area of Wardha district of Maharashtra, India". Indian J Med Res 146, pp 654-661, DOI: 10.4103/ijmr.IJMR_256_15.
- Mohanty, R. K. and Behera DK (2020). "How Effective is Public Health Care Expenditure in Improving Health Outcome? An Empirical Evidence from the Indian States", National Institute of Public Finance and Policy New Delhi, Working Paper No. 300.
- Purohit, B. C. (2014). "Efficiency of social sector expenditure in India: a case of health and education in selected Indian states". *Healthcare in Low-resource Settings 2014; volume 2:1866*.
- Ram, M. and Kumar, A. (2021). 'Determinants of Healthcare Expenditure in Eastern Uttar Pradesh, India: Through the lens of NSSO Data'. Journal of Communicable Diseases Volume 53, Issue 3 - 2021, Pg. No. 118-126 DOI:<https://doi.org/10.24321/0019.5138.202147>.
- Rao, M. G. and Choudhury, M. (2008). "Inter- State Equalisation Of Health Expenditures In Indian Union". Healthcare Expenditures: Level and its Distribution, National Institute Of Public Finance And Policy, New Delhi
- Sriram, S. and Albadrani, M. (2022). "A Study Of Catastrophic Health Expenditures In India - Evidence From Nationally Representative Survey Data: 2014-2018". F1000Research 2022, 11:14.
- Sudhakara, H. and Prasad, T. R. (2016). 'Healthcare Expenditure In India -An Analysis', Shanlax International Journal of Economics, Volume 5, Issue 1, ISSN: 2319- 961X.