



HUMAN CAPITAL FORMATION AND HEALTH INFRASTRUCTURE IN INDIA: AT GLOBAL LEVEL ANALYSIS

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Abstract

The paper overviews the India's position in human capital formation in health infrastructure at global level. The study is based on secondary data the data collected from World Health Organisation. Simple statistical tools such as percentage, ratio, growth rate used to analyse the India's position in human capital formation in health infrastructure at global level. The term human capital arrangement infers the advancement of capacities and aptitudes among the number of inhabitants in the nation. To change the obligation of the tremendous size of populace into resources selection of different measures for human capital development is particularly fundamental. Schultz overviewed the basic information and analytical methodologies which are most essential required tools to evaluate the productive returns to investments in public health were only beginning to be assembled. Health is the major factor for determining human physical productivity. The vicious circle of poverty given by Ragnar Frisch also links with low productivity through low saving and consumption. Public expenditure on health in India is lower than major advanced countries and low income group nations. public health expenditure in India is not sustainable to meet the needs of large mass hence both central and state governments need to take positive steps for health expenditure to create human capital.

Keywords: Human Capital, Economic Development, Health, Public Expenditure on Health.

1. Introduction

The term human capital arrangement infers the advancement of capacities and aptitudes among the number of inhabitants in the nation. To change the obligation of the tremendous size of populace into resources selection of different measures for human capital development is particularly fundamental. As per Harbison, the human capital arrangement specifies, "the way toward gaining and expanding the quantity of people who have what it takes, training and experience which are basic for the monetary and the political advancement of the nation. Human capital arrangement is therefore connected with interest in man and his improvement as an inventive and beneficial asset."

Endogenous growth theory holds that economic growth is primarily the result of endogenous and not external forces. Endogenous growth theory holds that investment in human capital, innovation, and knowledge are significant contributors to economic growth. The theory also focuses on positive externalities and spill over effects of a knowledge-based economy which will lead to economic development. The endogenous growth theory primarily holds that the long run growth rate of an economy depends on policy.

Health is the major factor for determining human physical productivity. The vicious circle of poverty given by Ragnar Frisch also links with low productivity through low saving and consumption. This paper examines the human capital formation at global level and India's place among major advanced countries where human population is a human capital formation. The study intent to know whether human resource and economic development linked or not and it analyzes the prospects of India as human capital center in coming years.

2. Review of Literature

Buiter (1995) considered the effects of fiscal and financial policy on economic growth in open and closed economies, when human capital formation by young households were constrained by the illiquidity of human wealth. Both endogenous and exogenous growth versions of the basic growth and development model were analysed. The study found that intergenerational redistribution policies which discouraged physical capital formation but encouraged human capital formation. Despite common technologies and perfect international mobility of financial capital, the non-traded-ness of human capital and the illiquidity of human wealth make for persistent differences in productivity growth rates in the endogenous growth version of the model or in their levels in the exogenous growth version. The study also considered the productivity growth (or level) effects of public spending on education and of the distortionary taxation of financial asset income.

Schultz overviewed the basic information and analytical methodologies which are most essential required tools to evaluate the productive returns to investments in public health were only beginning to be assembled. There were strong indications that health limitations were a costly burden on the productive potential of adults in Africa and it was explained in earlier empirical study of Schultz and Tansel in 1993. A third or more of the gains in labour productivity achieved in the last two hundred years in Western Europe were linked to improvements in health, nutrition, and resulting gains in adult height.



Scattered surveys indicated that advancements in nutrition were reflected in gains in adult height in Africa as they were in the previous period in Europe, and indeed life expectancy has risen more rapidly in Africa than it has in developed countries. But these recent health gains in low income countries were closely related to increases in female education, per capita income, and in Africa with urbanization. As these indicators of progress in education and development have ceased to rise in many African countries consequence health improvements were slow or stagnate. The region remains a laggard in those crude indicators of mortality that were reported by international agencies. The study outlined a framework within which to assess the contribution of health and schooling to increasing individual and aggregate income, as well as the possible feedback of increasing income on the demand for human resources. It then evaluated how African countries have improved from 1970 to 1985 in terms of survival and schooling, compared with other countries, to place in perspective areas of achievement and the aggregate composition of human capital formation in the African region. Several microeconomic studies were used as base then described in more detail which illustrated the magnitudes of private returns to health and schooling in West Africa, some of the consequences of the rationed supply of schooling in South Africa, and evidence of returns to the quality of schooling. The concluding section extracts lessons as to how to conduct country-specific research based on merged household and community surveys to estimate the key parameters describing the private and social returns to marginal investments in health, education, and mobility.

3. Objectives of the Study

1. To analyze the India's position in human capital formation in health infrastructure at
2. global level.
3. To offer policy suggestions for the improvement of health infrastructure in India.

4. Methodology

The study is based on secondary data the data collected from World Health Organisation. Simple statistical tools such as percentage, ratio, and growth rate analysis used for causal relation and trend analysis of human capital formation.

5 Results and Discussion

5.1 Demographic Profile of India and World

Table 5.1 illustrates the demographic profile of India and the world during 2000 to 2025. According to World Bank report India population was 1,053.5 million in 2000 which has increased to 1,311.1 million in 2015 and projected population in 2025 will be 1,461.6 million that is a 11.47% change from 2015 to 2025 which is higher than the world growth rate 10.79% in the same period. Average population growth in India is 1.5% during 2000-2015 whereas average annual world population growth rate was 1.2% in the same period. Average annual growth rate of population during 2000-2015 was 1.5% in India, which is matched in South Asia, while in Sub-Saharan Africa it was highest in the world at 2.7%. The lowest population growth was recorded in Europe and Central Asia at 0.3% during 2000 to 2015 period, followed by East Asia and Pacific 0.7%, Latin America & Caribbean nations 1.2%, Middle East & North Africa 2% and North America recorded 0.9%, The working population that is 15-45 age old population is higher in emerging nations than advanced economies. The demographic dividend is high in India than any other country in absolute numbers while population in the age group under 14 age is very high in Sub-Saharan African nations which accounted 37% in 2014 while it was 24% in Middle East & North Africa, 21% in South Asia, 20% in India, 17% in Latin America & Caribbean nations, 14% in East Asia & Pacific nations, 12% each in Europe & Central Asia and North America.

Table 5.1 Demographic Profile at Global Level

	Population			Average Annual Population Growth %		Population Age Composition			Dependency Ratio		Crude Death Rate	Crude Birth Rate
						Ages 0-14	Ages 15-64	Ages 65+	Young	Old		
	Millions					%	%	%	% of working-age population	% of working-age population	per 1,000 people	per 1,000 people
	2000	2015	2025 (Projected)	2000-15	2014	2014	2015	2015	2015	2015	2014	2014
India	1,053.5	1,311.1	1,461.6	1.5	7	20	66	6	44	9	7	20
World	6,115.4	7,346.6	8,139.3	1.2	8	19	66	8	40	13	8	19
East Asia & Pacific	2,045.7	2,279.2	2,386.3	0.7	7	14	71	10	28	14	7	14
Europe & Central Asia	862.0	907.9	922.8	0.3	10	12	67	16	27	23	10	12



Latin America & Caribbean	525.9	633.0	694.0	1.2	6	17	67	8	39	11	6	17
Middle East & North Africa	315.1	424.1	497.4	2	5	24	65	5	46	7	5	24
North America	313.0	357.3	383.6	0.9	8	12	66	15	28	22	8	12
South Asia	1,386.0	1,744.2	1,962.8	1.5	7	21	65	5	46	8	7	21
Sub-Saharan Africa	667.7	1,001.0	1,292.4	2.7	10	37	54	3	80	6	10	37
Low income	423.7	638.3	823.9	2.7	9	36	54	3	79	6	9	36
Lower middle income	2,312.5	2,927.4	3,346.0	1.6	8	23	64	5	48	8	8	23
Upper middle income	2,304.4	2,593.7	2,735.7	0.8	7	15	70	9	29	13	7	15
High income	1,074.9	1,187.2	1,233.7	0.7	8	11	66	17	25	26	8	11

Note: NA denotes Not Available

Source: World Health Organisation

Even though having huge demographic dividend in India and low income countries, there is simultaneously huge dependency ratio of young population in these countries compared to the high-income group of nations and it is illustrated in the table 3.1. Dependency ratio of young population in India is 44% during 2015 while in North America it is 28%, Europe and Central Asia recorded 27% whereas in Sub-Saharan African nations recorded highest dependency ratio in the world at 80% in the same period. Meanwhile, dependency ratio of old age population on working age population is lower in low income nations compared to high income nations in 2015. In low income nations dependency ratio of old age people on working population is 6%, slightly higher in lower middle income nations at 8%, 13% in upper middle income nations while high income nations accounted highest old age people dependency ratio at 26% in 2015. North America and Europe recorded high old age people dependency ratio on working age population at 22% and 23% respective during 2015 while it is low in India at 9%. Therefore, old age medical expenditure in advanced countries is higher than low income nations which also led to increase in longevity of life. The crude death rate (CDR) and crude birth rate (CBR) are low in high income nations compared to low income nations. The CDR in India is 7 per thousand people which is slightly lower than the world average and high income nations of CDR of 8 per thousand people each in 2014 whereas in Sub-Saharan Africa it is 10 per thousand people. In the same period, the CBR in India is 20 per thousand people which is slightly higher than the world average CBR at 19 per thousand people whereas in Sub-Saharan Africa it is highest 37 per thousand people, 36 in low income nations, 11 in high income nations. The lack of literacy in low income countries has led to high CBR.

Table 5.2 Demographic Profile in G20 Nations

	Population			Average annual population growth %		Population age composition			Dependency ratio		Crude death rate	Crude birth rate
						Ages 0-14	Ages 15-64	Ages 65+	Young	Old		
	Millions					%	%	%	% of working-age population	% of working-age population	per 1,000 people	per 1,000 people
	2000	2015	2025 (Projected)	2000-15	2015-25 (Projected)	2015	2015	2015	2015	2015	2014	2014
Brazil	175.8	207.8	223.0	1.1	0.7	23	69	8	33	11	6	15
Canada	30.8	35.9	38.9	1	0.8	16	68	16	24	24	7	11
China	1262.6	1371.2	1409.0	0.5	0.3	17	73	10	24	13	7	12
Hong Kong	6.7	7.3	7.8	0.6	0.6	12	73	15	16	21	6	9
France	60.9	66.8	69.3	0.6	0.4	18	62	19	30	31	8	12



Germany	82.2	81.4	80.4	-0.1	-0.1	13	66	21	20	32	11	9
India	1053.5	1311.1	1461.6	1.5	1.1	29	66	6	44	9	7	20
Israel	6.3	8.4	9.7	1.9	1.5	28	61	11	46	18	5	21
Japan	126.8	127.0	122.7	0	-0.3	13	61	26	21	43	10	8
Luxembourg	0.4	0.6	0.6	1.8	1.2	16	70	14	24	20	7	11
Norway	4.5	5.2	5.7	1	0.9	18	66	16	27	25	8	12
Russia	146.6	144.1	141.9	-0.1	-0.2	17	70	13	24	19	13	13
Singapore	4.0	5.5	6.1	2.1	1	16	73	12	21	16	5	10
Sri Lanka	18.7	21.0	21.7	0.8	0.3	25	66	9	37	14	7	16
United Kingdom	58.9	65.1	68.9	0.7	0.6	18	64	18	28	28	9	12
United States	282.2	321.4	344.7	0.9	0.7	19	66	15	29	22	8	13
World	6115.4	7346.6	8139.3	1.2	1	26	66	8	40	13	8	19

Note: NA denotes Not Available

Source: : World Health Organisation

5.3 Health Infrastructure at Global Level

The data illustrated in the table 5.2 shows the demographic profile of G20 countries during 2000 to 2015 and projected population in 2025. During 2000 to 2015 population growth rate in India registered 24.45% whereas it is 8.6% in China, 13.9% in the USA and 20.13% at world population growth rate in the same period. The population growth rate is high in India during 2000 to 2015. The projected population of India in 2025 is 1461.6 million that is 11.47% growth rate from 2015 to 2025 which shows that population growth rate in India is declining in coming years. It is a good sign for human capital formation through effective utilization of available resources. The world population projected at 8139.3 million in 2025 and its growth rate from 2015 to 2025 is 10.79% which is lower than projected population growth rate in India that is 11.47%. Average annual population growth rate in India is 1.5% during 2000-2015 whereas it is 1.2% of world, 2.1% in Singapore, 1.9% in Israel, 1.1% in Brazil while it is negative in Germany at -0.1% and -0.1% in Russia. As for projection of ... India's annual growth rate of population from 2015 to 2025 will be 1.1% which is still higher than 1% and advanced economies have less than 1%.

The demographic dividend that is working age population between 15 years to 64 years is high in India. In 2015, India accounted 66% working age population which is moderate compared to advanced economies. In the USA, the working populace (i.e. 15-64 age) is 66% in 2015, followed by Brazil 69%, Canada 68%, France 62%, Germany and Norway 66% each, 73% in China and Hong Kong each, etc. However, young populace under 14 years' age old is high in India that is 29% which has economic edge regarding huge labour force in coming years. If this young populace transferred to human resource then India is the leader in the human capital and it can outsource service much more and marginal productivity of labour further enhances. The dependency ratio of young population on working age population is high in India at 44% compared to average 25% in advanced economies while old age population dependency on working age population in India is 9% which is least among G20 countries. Therefore, India has comparative advantage in demographic dividend and working age population compared to advanced economies and major emerging nations like China and Brazil. In 2014, the CDR is low in India at 7 per thousand population compared to world average 8 persons, Germany 11, Japan 10, Russia 13 and CBR are very high in Israel 21, followed by India at 20 per thousand and world CBR at 19 persons.

Table 5.4, Health Workers at Global Level

	Physicians Per 1,000 People	Nurses And Midwives Per 1,000 People	Hospital Beds Per 1,000 People	Completeness Of Birth Registration In %	Completeness Of Death Registration In %
	2008-14	2008-14	2007-12	2008-15	2007-13
India	0.7	1.7	0.7	71.9	8
World	1.5	3.3	NA	69.9	51.2
East Asia & Pacific	1.6	2.6	3.5	NA	22.3



Europe & Central Asia	3.4	7.5	5	99.5	98.3
Latin America & Caribbean	2	4.2	2	93.5	92.1
Middle East & North Africa	1.6	2.5	1	91.9	NA
North America	2.4	9.8	2.9	100	98.2
South Asia	0.7	1.4	0.7	61.9	8
Sub-Saharan Africa	0.2	1.2	NA	45.9	NA
Low income	0.1	NA	NA	45	NA
Lower middle income	0.8	1.7	NA	64.2	NA
Upper middle income	2	3	3.4	NA	44
High income	2.9	8.6	4.2	100	98.8

Note: NA denotes Not Available

Source: World Health Organisation

The health infrastructure in India is not improved much compared to other major advanced and emerging nations. The health infrastructure is measured in terms of number of physicians, nurses and other medical helpers available for thousand population. Table 5.4 shows the health workers at global level in recent past. Physicians per thousand people is highest in Europe and Central Asia at 3.4 followed by North America 2.4, Middle East & North Africa along with East Asia & Pacific 1.6 each while India accounts 0.7 which is slightly better than low income countries and Sub-Saharan African nations which accounted 0.1 and 0.2 respectively. Similarly, nurses and midwives (i.e. medical helpers) per thousand people also low in India at 1.7 compared to Europe and Central Asia at 7.5 followed by North America 9.8, Middle East & North Africa 2.5 while India accounts 0.7 which is slightly higher than south Asia 1.4 and Sub-Saharan African nations 1.2 during 2008 to 2014 period. Hospital beds per thousand people in India is 0.7 which is same in south Asia and remaining regions have more than 1 in lower middle income nations and more than 3 in western nations.

Table 5.4 shows the health workers at international level with comparison to India during 2008 to 2014. The data shows that India accommodated less than 1 person that is 0.7 physicians per 1,000 people whereas in China it is 1.9, Australia 3.3, France 3.2, Germany 3.9, Israel 3.3, Japan 2.3, Luxembourg 2.9, Russia 4.3, Singapore 2, the UK 2.8, the USA 2.5 and the world average is 1.5 which is higher than Indian scenario of physicians per 1000 population. Not only physicians but also nurses are also less number in India. In India, there is only 1.7 nurses per thousand population whereas in China it is 1.9, Australia 10.6, France 9.3, Germany 11.5, Israel 5, Japan 11.5, Luxembourg 12.6, Russia 8.5, Singapore 5.8, the UK 8.8, the USA 9.8 and the world average is 3.3 during 2008 to 2014.

	Physicians per 1,000 people	Nurses and midwives per 1,000 people	Hospital beds per 1,000 people	Completeness of birth registration in %	Completeness of death registration in %
	2008-14	2008-14	2007-12	2008-15	2007-13
Australia	3.3	10.6	3.9	100	100
China	1.9	1.9	3.8	NA	4
France	3.2	9.3	6.4	100	100
Germany	3.9	11.5	8.2	100	100
India	0.7	1.7	0.7	71.9	8
Israel	3.3	5	3.3	100	100
Japan	2.3	11.5	13.7	100	100
Luxembourg	2.9	12.6	5.4	100	100
Russia	4.3	8.5	NA	100	100



Singapore	2	5.8	2	NA	74
United Kingdom	2.8	8.8	2.9	100	100
United States	2.5	9.8	2.9	100	98
World	1.5	3.3	NA	69.9	51.2

Note: NA denotes Not Available

Source: World Health Organisation

India is the second largest country in terms of population while health physicians and workers are not matching the needs of population. Looking at number of hospital beds per thousand people in India is least compared to world major nations. Hospital beds per thousand people in India is 0.7 that is less than one bed compared to China it is 3.8, Australia 3.9, France 6.4, Germany 8.2, Israel 3.3, Japan 13.7, Luxembourg 5.4, Singapore 2, the UK 2.9 and the USA 2.9 during 2007 to 2012 period. Moreover, birth registration in India is still 71.9% which is 100% in advanced countries and world average is 69.9% during 2008 to 2015 period. On the other hand, completeness of death registration during 2007 to 2013 in India is 8%, followed by China 4%, Singapore 74%, the USA 98% and remaining advanced countries reached 100% registration while world average death registration is at 51.2% in the same period.

5.6 Health Expenditure Pattern at Global level

Health is the major factor for determining human physical productivity. The vicious circle of poverty given by Ragnar Frisch also links with low productivity through low saving and consumption. Table 5.6 shows the health expenditure indicators at group of nations and continental level with comparison to India in 2014. India's health expenditure as a percentage of GDP is 4.7% which is slightly higher than South Asia 4.4% and lower middle income nation's group 4.5% but lower than Sub-Saharan African nations whereas in Europe and Central Asia 9.5%, North America 16.5%. India has huge health expenditure bill in absolute but in terms of as percentage of GDP and per capita health expenditure are lower in India compared to major emerging and developed nations. The per capita health expenditure in India is 75 \$ in 2014 which is lower than Sub-Saharan Africa 98\$, and slightly higher than South Asia 67 \$, Low Income nations 37\$ whereas in Europe and Central Asia 2,420 \$ and in North America per capita health expenditure is highest in the world at 8,990 \$. However, in terms of PPP (Purchasing Power Parity) per capita health expenditure in India is 267 \$ which is higher than Sub-Saharan Africa 200 \$. The per capita health expenditure at world level is 1,061 \$ and total health expenditure as percentage of GDP is 9.9% which are higher than India.

Table 5.6 Health Expenditure Trends at Global level - 2014

	Total % of GDP	Public % of total	Out of pocket % of total	External resources % of total	per capita in \$	per capita PPP \$
India	4.7	30	62.4	1	75	267
World	9.9	60.1	18.2	0.2	1,061	1,276
East Asia & Pacific	6.9	66.2	25.1	0.3	643	903
Europe & Central Asia	9.5	75.5	17	NA	2,420	2,577
Latin America & Caribbean	7.2	51.2	31.7	0.5	714	1,112
Middle East & North Africa	5.3	60.7	31.1	0.8	433	960
North America	16.5	49.6	11.2	NA	8,990	8,925
South Asia	4.4	31.2	61.5	2.3	67	234
Sub-Saharan Africa	5.5	42.6	34.5	11.2	98	200
Low income	5.7	42.4	37.2	33.2	37	91
Lower middle income	4.5	36.4	55.7	3.3	90	270
Upper middle income	6.2	55.2	32.2	0.3	518	930
High income	12.3	62.3	13.3	NA	5,251	5,193

Note: NA denotes Not Available

Source: World Health Organisation



Table 5.6 shows the health expenditure indicators at international level with comparison to India in 2014. India health expenditure as a percentage of GDP is 4.7% which is slightly lower than Singapore 4.9% and China 5.5%. It is highest in the USA (United States of America) 17.1%, followed by France 11.5%, Germany 11.3%, Japan 10.2%, Australia 9.4%, the UK (United Kingdom) 9.1%, Brazil 8.3%, Russia 7.1% and Luxembourg 6.9%. Public expenditure on health is more than 50% in major advanced and emerging nations except India, Brazil and Singapore which accounted 30%, 46% and 41.7% respectively. Per capita health expenditure as for PPP in India is 267 \$ which is least among advanced countries and very low compared to World average 1,276 \$ and China 731 \$. The United States accounted 9,403 \$ per capita expenditure on health (based on PPP) followed by Luxembourg 6812 \$, Germany 5182 \$, France 4,508 \$, Australia 4,357 \$, Singapore 4,047 \$, Japan 3,727 \$, the UK 3,377 \$, Israel 2,599 \$, Russia 1,836 \$ and Brazil 1,318 \$ in 2014.

Table 5.7 Health Expenditure Trends in Major G20 countries in 2014						
	Total % of GDP	Public % of total	Out of pocket % of total	External resources % of total	per capita in \$	per capita PPP \$
Australia	9.4	67	18.8	NA	6,031	4,357
Brazil	8.3	46	25.5	0.1	947	1,318
China	5.5	55.8	32	0	420	731
France	11.5	78.2	6.3	NA	4,959	4,508
Germany	11.3	77	13.2	NA	5,411	5,182
India	4.7	30	62.4	1	75	267
Israel	7.8	60.9	27	NA	2,910	2,599
Japan	10.2	83.6	13.9	NA	3,703	3,727
Luxembourg	6.9	83.9	10.6	0	8,138	6,812
Russia	7.1	52.2	45.8	NA	893	1,836
Singapore	4.9	41.7	54.8	0	2,752	4,047
United Kingdom	9.1	83.1	9.7	NA	3,935	3,377
United States	17.1	48.3	11	NA	9,403	9,403
World	9.9	60.1	18.2	0.2	1,061	1,276

Note: NA denotes Not Available

Source: World Health Organisation

6. Conclusion

Public expenditure on health in India is lower than major advanced countries and low income group nations. Public expenditure out of total expenditure on health in India is 30% and remaining was covered by private investment whereas in European countries it is 75.5%, North America accounts 49.5%, Sub-Saharan Africa 42.6%, Low income nations 42.4%, Lower middle income nations 36.4% and world average public expenditure on health is 60%. Therefore, it is clearly indicating that public health expenditure in India is not sustainable to meet the needs of large mass hence both central and state governments need to take positive steps for health expenditure to create human capital.

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