

Health Outcomes in Low, Medium, High and Very High Human Developed Countries: A Cross Comparison with Pakistan

Rehan Ahmad Khan Sherwani, Shumaila Abbas, Shahid Kamal

College of Statistical and Actuarial Science, University of the Punjab, New Campus, Lahore.

Abstract

Background: Health is a key component of human development and economic growth of a country in addition to education and gross domestic product.

Objectives: To determine the health outcomes in four human development index countries and to make a comparison of these with the health indicators of Pakistan.

Materials and Methods: The data used in the current study was a secondary data obtained from United Nations Development Report (UNDP) published in 2015 including several variables representing health outcomes of a country.

Results: Pakistan spent 2.8% of its gross domestic product in public health programs which is lower than the average amount spent by low, medium, high and very high human development index countries. Number of medical doctors available per 10,000 people in Pakistan is 8.3 which is higher than the average number in low human development index (1.3), almost similar with the medium human development index (8.2) but much lower than the high (18.7) and very high (28.7) human development index countries. All the health outcome variables were significantly ($p < 0.01$) different across the four types of human development index groups.

Conclusion: Low life expectancy, high mortality ratios, low vaccinations, child malnutrition, less number of physicians and a very low percentage of gross domestic product spent on health are the major barriers in human development of the country.

Key words: Health, health outcomes, human development index.

Introduction

Human capital plays a pivotal role in the economic growth of a country. In this context, health status is an essential component of individuals at work and consequently the relative strength of health outcomes determine the growth of human development of a country.¹ In most parts of the world, individuals are physically more beneficial, living longer, on account of their better health administrations, living conditions and the more across the board utilization of vaccination, anti-

infection agents and better contraceptives.² In spite of the fact that this pattern is probably going to proceed with, trusts are blurring in a few locales where advance impeded or ceased in the 1990s, fundamentally as a consequence of the AIDS pestilence. Moreover, most locales of the advanced world won't, at the present pace, reach the Millennium Development Goals for health by 2015 including lessening kid and maternal mortality, battling HIV/AIDS, intestinal sickness, and different ailments.³

Individuals in developing countries experience ill effects of far higher rates of irresistible maladies (e.g., infections, microbes, growth, measles, chickenpox or parasites), than do individuals in the developed world. For instance, around 99% of the deaths from AIDS, tuberculosis and intestinal sickness reported from developing nations.⁴

Additional proof of the significance of health to manageable advancement are the developing number of reports, like the WHO Commission on Macroeconomics and Health (1999), 60 reports underlining the requirement for more prominent interests in health through expanded open financing. These reports have highlighted the multiplier impacts of interest in health and the 'cost of disregard' from preventable demise and disability, emphasizing the need to address not only sicknesses but

Corresponding Author:

Rehan Ahmad Khan Sherwani
College of Statistical and Actuarial Science
University of the Punjab, New Campus, Lahore.
Email: stat4u@gmail.com

Received: 09 March 2017, Accepted: 12 September 2017,

Published: 29 September 2017

Authors Contribution

RAKS has done the conceptualization of project. RAKS and SA did the data collection. SA and SK have done the literature search. RAKS and SK also did the statistical analysis. Drafting, revision and writing of the manuscript were done by RAKS, SA and SK. SK also supervised the study.

rather the more extensive measurements and determinants of health.⁵ Health budget, number of physicians, number of beds in hospitals and number of dispensaries are associated with economic growth in Pakistan as better health facilities shares a lot in economic growth of a country.⁶ Research & design, labor and health are the key factors of economic growth in Pakistan where long run relationship has been observed between health and economic growth.⁷ Mortality rate, life expectancy and health expenditures are positively associated with economic growth in Pakistan.⁸ In this paper, we compared the health outcomes in very high, high, medium and low human development countries. In addition, results were also compared with the health outcome statistics in Pakistan.

Materials and Methods

The data used in the present research was a secondary data obtained from United Nations Development Report published in 2015.⁶ The variables under consideration in present research include life expectancy at birth (years) which is the number of years a baby could hope to live if prevalent designs of age-particular death rates at the period of birth remain the same all through the newborn child's life. Ratio of maternal mortality is a count of losses per hundred thousand live birth because of problems associated with pregnancy. Maternal mortality ratio was included in the study because it represents to some extent the medical facilities available in the country and can be considered an indicator of health outcomes. Birth rate for adolescent is a count of birth to ladies from 15 to 19 years of age for everyone thousand ladies of the same age group. Overall fecundity rate, Newborn children lacking vaccination against DPT is the percentage of surviving babies who had not done their first measurements of diphtheria, pertussis and tetanus immunization. Newborn children lacking inoculation against measles is the percentage of surviving babies who had not completed the main measurements of measles immunization. Newborn child death rate is the probability of death amongst birth and 1st year of age per 1,000 live births. Under five years child death rate is the probability of death amongst birth and precisely age 5, communicated per 1,000 live births. Child malnutrition is the percentage of under age 5 children with lack of required quantity of food. Female or male adult mortality is the probability that a 15-year-old will die before achieving age 60, communicated per 1,000 individuals.

Deaths from malaria and tuberculosis are a count of expiries because of malaria and tuberculosis from affirmed and likely cases, communicated per 100,000 individuals. HIV commonness, grown-up is the percentage of the populace ages 15 to 49 with HIV positive. Life expectancy at age 60 is the surplus count of years that an individual of aged 60 could hope to live further. Physicians are the count of available medical doctors per 10,000

persons and lastly, public health expenditures are the current and capital spending on wellbeing from government (focal and neighborhood) spending plans, outside obtaining and gives (counting gifts from worldwide offices and nongovernmental associations) and social (or necessary) medical coverage reserves, communicated as a rate of gross domestic product (GDP). In present data human development index (HDI) was calculated from 188 countries (very high 49, high 56, medium 39 & low 44) and the classifications of HDI were based on the quartiles of the HDI distribution. HDI was comprised of three components; longevity, education level and decent standard of living. These three components were computed as:

Longevity = Life Expectancy Index (LEI) =

$$\frac{\text{Life Expectancy} - \text{Life Expectancy}_{\min}}{\text{Life Expectancy}_{\max} - \text{Life Expectancy}_{\min}}$$

$$\text{Education Index (EI)} = \frac{2}{3} * \left[\left(\frac{\text{Adult Literacy} - \text{Adult Literacy}_{\min}}{\text{Adult Literacy}_{\max} - \text{Adult Literacy}_{\min}} \right) + \left(\frac{\text{Enrollment} - \text{Enrollment}_{\min}}{\text{Enrollment}_{\max} - \text{Enrollment}_{\min}} \right) \right]$$

$$\text{GDP Index (GDPI)} = \frac{\log_e (\text{GDP}) - \log_e (\text{lowest GDP})}{\log_e (\text{highest GDP}) - \log_e (\text{lowest GDP})}$$

HDI is simply the average of these three components i.e.,

$$\text{HDI} = \frac{\text{LEI} + \text{EI} + \text{GDPI}}{3}$$

Cutoff values of HDI were based on quartiles (< 0.550, 0.550-0.699, 0.700-0.799, ≥ 0.800) and used to classify the 188 countries into low, medium, high and very high human development countries. Descriptive statistics and one-way analysis of variance test was used to analyze the data. All the data were analyzed in SPSS v 24.

Results

Results presented in Table depicted that life expectancy at birth was significantly different across all the HDI groups and observed highest in very high HDI countries (79.9 years) followed by high (74.4), medium (68.4) and low (59.6) HDI nations while in Pakistan it was 66.2 years. Maternal mortality ratio was highest in low HDI countries (470.0) followed by medium (138.5), high (42.7) and very high (10.2) HDI countries while in Pakistan it was 170. Juvenile birth rate was lowest in very high (12.3) followed by high (35.5), medium (59.2) and low (94.4) while in Pakistan it was 27.3. Total fertility rate for very high, high medium and low HDI countries were 1.7, 2.0, 3.2 and 4.8 respectively while for Pakistan its value was 3.2. Infants lacking immunization distal tingling on percussion (DTP) was lowest for very high HDI countries (2.4) followed by high (2.9), medium (8.9), and low (12.2) HDI countries while in Pakistan its value was 21.0.

Similarly, infants lacking immunization measles was lowest in high HDI countries (5.2) followed by very high (5.4), medium (14.7), and low (23.2) while in Pakistan its value was 39.0. Infant's mortality rate was lowest for very high HDI countries (4.2) followed by high (12.8), medium (31.5), and low (59.0) while in Pakistan its value was 69.0. Similar pattern was observed for under five years mortality rates, female and male adult mortality rates. Child malnutrition was lowest in very high HDI countries (1.4) followed by high (10.0), medium (26.8), and low (37.7) while this figure for Pakistan was 45.0. Deaths due to malaria, tuberculosis and prevalence of HIV were lowest in very high followed by high, medium and low HDI countries. Physicians available per 10,000 people were lowest in low HDI countries (1.3) followed by medium (8.2), high (18.7) and very high (28.7) HDI countries. Lastly, government expenditures on health sector were highest for very high (7.9) followed by high (6.4), low (6.0) and medium (6.0) while its value for Pakistan is only 2.8. All the health outcome variables presented in Table were significantly ($p < 0.01$) different across the four types of HDI.

Table: Mean values of Health outcome variables across HDI categorized countries and Pakistan.

Health Outcomes and Associated Variables	HDI Countries				Pakistan
	Very High	High	Medium	Low	
Life expectancy at birth (years)*	79.9	74.4	68.4	59.6	66.2
Maternal mortality ratio (deaths per 100,000 live births)*	10.2	42.7	138.5	470.0	170.0
Adolescent birth rate (births per 1,000 women ages 15-19)*	12.3	35.5	59.2	94.4	27.3
Total fertility rate (births per woman) 2010/2015*	1.70	2.0	3.2	4.8	3.2
Infants lacking immunization DTP (% of 1 year old)*	2.4	2.9	8.9	12.2	21.0
Infants lacking immunization measles (% of 1 year old)*	5.4	5.2	14.7	23.2	39.0
Infants mortality rates (per 1,000 live births)*	4.2	12.8	31.5	59.0	69.0
Under five years mortality rates (per 1,000 live births)*	5.0	14.8	40.3	86.0	85.5
Child malnutrition (%)	1.4	10.0	26.8	37.7	45.0

under age 5)*					
Female adult mortality rate (per 1,000 people)*	52.0	95.3	159.1	276.5	155.0
Male adult mortality rate (per 1,000 people)*	101.3	173.2	232.7	321.2	189.0
Deaths due to Malaria (per 100,000 people)*	0	0.2	13.2	57.8	1.8
Deaths due to tuberculosis (per 100,000 people)*	1.0	3.5	18.2	31.4	34.0
HIV prevalence (% ages 15-49)*	0.1	0.4	2.2	3.5	0.1
Life expectancy at age 60 (years)*	21.7	19.0	18.4	16.1	17.4
Physicians (per 10,000 people)*	28.7	18.7	8.2	1.3	8.3
Public health expenditures (% GDP)*	7.9	6.4	5.7	6.0	2.8

* $p \leq 0.01$

Discussion

The significance of health was perceived, with three millennium development goals.⁷ In Pakistan, the health position of the populace is low, especially among women and children, and 50% of the newborns reaching age 12-23 months are not completely vaccinated resulting in high mortality and low life expectancy as the results showing higher mortality and low life expectancy in Pakistan when compared with the developed countries. Access to other fundamental administrations like safe water and sanitation is also extremely poor, and this together with poor nourishing status has a noteworthy influence in the thick cycle of sickness, low efficiency and destitution.⁸ Life expectancy is one of the indicators of better health status of a country. Although, expected life at the time of birth and at the age of 60 in Pakistan were comparatively higher than the average in the low human developed countries but smaller than the rest of the HDI groups.⁹

Juvenile birth rate and the fecundity rate are controlled in Pakistan when compared with low and medium human developed countries but still lot of actions need to be taken for the improvement in these statistics. The aggregate ripeness rate (the normal number of youngsters destined to a lady over her lifetime) declined from 6.4 towards the start of the decade to around 5 towards the finish of the decade.¹⁰ Disregarding this advance, the newborn child death rate and aggregate richness rate keep on being high by territorial guidelines, as different nations in the locale have outperformed Pakistan's execution.¹¹ An investigation of the weight of infection (measure of misfortunes of solid life as

incapacity and sudden passing) in 1996 demonstrated Pakistan at an early stage in its epidemiological move with preventable or promptly treatable ailments influencing fundamentally youthful kids and ladies of regenerative age, representing a prevailing offer of mortality and grimness.¹²

Improvement has been made in various automatic zones, generally eminently polio annihilation, fortifying the tuberculosis control program, and preventative prevalence.¹³ Enhancement has not been so great with the normal vaccination program; the rate of completely vaccinated youngsters 12-23 months of age is still a long way, as currently reported 52 percent by and large (1998/99 PIHS), with a substantial urban-provincial differential and a littler male - female differential.¹⁴ There is expanding acknowledgment by the Government of the risk postured by HIV/AIDS. Despite the fact that HIV diseases is low but risk for an HIV/AIDS pandemics exist in Pakistan, and the experience of different nations demonstrates that the commonness of HIV contamination can increment quickly.¹⁵ In spite of the fact that there has been a log jam before two years, the quantity of group based health specialists has risen and the accessibility of female specialists and paramedics has enhanced fundamentally in all areas.¹⁶ This has brought about better accessibility of administrations and counsel at the grass-roots, particularly in the territory of maternal and youngster health and family arranging – and added to the diminishment in newborn child passings specified.

Health is pivotal for manageable human advancement, both as a basic human right and a fundamental patron to the monetary development of society. Improved health outcomes in Pakistan will result longer life expectancy, lower mortality rates and consequently better human development as we have seen this from the results of developed countries. Pakistan spent only 2.8% of its GDP on health sector while in developed countries this figure is manifold resulting better health outcomes e.g., number of physicians available per 10,000 people in Pakistan is only 8.3 while in high and very high human developed countries, it is 18.7 and 28.7 respectively. Moreover, child malnutrition in very high human developed countries is 1.4 per 1000 while in Pakistan it is 45. So all these statistics and other leads towards an intention to policy makers to pay attention towards health sectors and increase the health budget in order to gain the better health outcomes and consequently well human development in the country as many health programs or policies fail due to lack of resources.

Conflict of interest: None declared.

References

1. Clift J. Health and development. A compilation of articles from Finance & Development. International Monetary Fund Washington, DC December;2004.

2. Khazaei S, Armanmehr V, Nematollahi S, Rezaeian S, Khazaei S. Suicide rate in relation to the Human Development Index and other health related factors: A global ecological study from 91 countries. *J Epidemiol Glob Health* 2017;7(2):131-4.
3. Lou LX, Chen Y, Yu CH, Li YM, Ye J. National HIV/AIDS mortality, prevalence, and incidence rates are associated with the Human Development Index. *Am J Infect Control* 2014;42(10):1044-8.
4. Morales AJR, Hernández DMC. Relationships between morbidity and mortality from tuberculosis and the human development index (HDI) in Venezuela, 1998–2008. *Int J Infect Dis* 2012;16(9):704-5.
5. Susuman AS, Chialepeh WN, Bado A, Lailulo Y. High infant mortality rate, high total fertility rate and very low female literacy in selected African countries. *Scand J Public Health* 2016;44(1):2-5.
6. Chaudhary MO, Faridi MZ, Farooq F, Arif R. Contribution of Health Outcomes to Economic Growth in Pakistan. *Pak J Socia Sci* 2013;33(2):281-95.
7. Rehman NU, Khan KJ. Does health, accelerate economic growth in Pakistan? *Int J Asian Socia Sci* 2012;2(4):506-12.
8. Akram N, Padda IH, Khan M. The long term impact of health on economic growth in Pakistan. *The Pak Develop Rev* 2008;47(4):487–500.
9. United Nations Development Programme. Work for human development. Human Development Report;2015. (Accessed on 13th Setptember 2017) Available from URL:http://hdr.undp.org/sites/default/files/2015_human_development_report.pdf
10. Asadullah MN, Savoia A, Mahmud W. Paths to Development: Is there a Bangladesh Surprise? *World Develop* 2014;62:138-54.
11. Anyanwu JC. Health Expenditures and Health Outcomes in Africa. Economic Research Working Paper No 91 (December 2007). (Accessed on 13th Setptember 2017) Available from URL:<https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/26820442-EN-ERWP-91.PDF>
12. Hansen CW. Life expectancy and human capital: Evidence from the international epidemiological transition. *J Health Econ* 2013; 32(6):1142-52.
13. Hafner KA, Foulkes DM. Fertility, economic growth, and human development causal determinants of the developed lifestyle. *J Macroecon* 2013;38:107-20.
14. Alijanzadeh M, Asefzadeh S, Zare SAM. Correlation Between Human Development Index and Infant Mortality Rate Worldwide. *Biotech Health Sci* 2016;3(1):e35330.
15. Fitrianto A, Hanafi I, Chui TL. Modeling Asia's Child Mortality Rate: A Thinking of Human Development in Asia. *Procedia Economics and Finance* 2016;35:249-55.
16. Alsan M, Schoemaker L, Eggleston K, Kammili N, Kolli P, Bhattacharya J. Out-of-pocket health expenditures and antimicrobial resistance in low-income and middle-income countries: an economic analysis. *Lancet Infect Dis* 2015;15(10):1203-10.
17. Wang B, Giles L, Afzali HHA, Clarke M, Ratcliffe J, Chen G, et al. Adolescent confidence in immunisation: Assessing and comparing attitudes of adolescents and adults. *Vaccine* 2016;34(46):5595-5603.
18. GBD 2015 HIV Collaborators. Estimates of global, regional, and national incidence, prevalence, and mortality of HIV, 1980–2015: the Global Burden of Disease Study 2015. *Lancet HIV* 2016;3(8):361-87.

19. Bhargava A, Docquier F, Moullan Y. Modeling the effects of physician emigration on human development. *Econ Human Biol* 2011;9(2):172-83.