

Implications of the 7th NFC Award on Health Services in Pakistan

Muhammad Bakhtiar Khan¹, Zilakat Khan Malik², Wasim Shahid Malik³

Abstract

Fiscal decentralization is aimed to improve Public Services Delivery as the subnational governments get control of additional revenue and expenditures responsibilities and are in a better position to provide basic services to the local people. The 7th NFC Award is considered as a big step toward fiscal federalism wherein the criteria for horizontal and vertical distribution of resources has been changed to accommodate major demands of the federating units. This research paper has been an attempt to identify that to what extent the new fiscal arrangements under the 7th NFC Award has been successful to improve health services delivery in Pakistan. For this study data on various health indicators has been collected for the period 2001 to 2019 divided into two groups i.e., pre 7th NFC period (2001 to 2010) and post 7th NFC Award period (2011 to 2019).

To identify the impact of 7th NFC Award on health services delivery in Pakistan various variables were selected including Infant Mortality, Under Five Years' Mortality, Life Expectancy at Birth and Health Expenditures (%GDP) as dependent or endogenous variables at national level whereas for comparison at provincial level Life expectancy at birth and Under Five Years mortality were used as dependent variables. The variables were tested at the national level as well as the provincial level and interprovincial comparison was also performed. For the analysis purpose different techniques for trend analysis were applied including the Chow breakpoint test, recursive coefficient, Wald-Coefficient Restriction test, Equality of Variance test, trend estimates, Durbin Watson Test and Forecast analysis. Additionally, the Difference-in-Difference approach was also applied to compare other provinces as treatment groups i.e., Sindh, Khyber Pakhtunkhwa and Baluchistan with Punjab as a control group.

The results suggest health indicators have responded positively to the additional funds' transfer and Life expectancy at birth, Infant mortality and Under Five years' mortality have improved at national level. Life expectancy and under five years' mortality has generally improved in all provinces except for life expectancy in KP. While comparing the performance of other provinces with Punjab it is found that life expectancy at birth, infant mortality and Under

1 Ph.D. Scholar, University of Peshawar. Email: mbkhandr@hotmail.com

2 Professor at Department of Economics, University of Peshawar. Email: zilakat@uop.edu.pk

3 Professor at Department of Economics, University of Peshawar.

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Five years' mortality have improved in Sindh and Khyber Pakhtunkhwa while Baluchistan did not improve health indicators in comparison to Punjab.

However, to realize further benefits of the fiscal decentralization it is suggested that additional fund transfer is not a sufficient factor to bring change and should be complemented by administrative and legislative actions on part of the government. Innovations and the role of the private sector are crucial in improving public services delivery in health sector. Moreover, the capacity of the government machinery and the ability to develop plans and strategies is important to realize the benefits of the fiscal decentralization by the provinces.

Keywords: *Fiscal decentralization, Services Delivery, 7th NFC Award, Health Services*

1. Introduction

Fiscal decentralization involves the devolution of fiscal responsibilities to the subnational governments, provided with additional financial resources and powers to collect taxes and make expenditures according to the local needs. Fiscal decentralization is the devolution of responsibilities from central government to the sub-national governments for spending and revenue collection (Neyapti, 2004). Transfer of expenditure and revenue responsibilities to the sub-national governments, the inter-governmental fiscal transfers and entrusting borrowing powers to sub-national governments are the major pillars of fiscal decentralization (Bahl, 2006). To ensure the effectiveness of fiscal decentralization as a tool to improve public services, it is imperative that fiscal transfers shall be designed in such a way that the sub-governments should have a clear mandate, sufficient resources and appropriate flexibility to make decisions and be accountable for results (Bird & Smart, 2002). Decentralization results in larger variety of public goods taking into account local needs and preferences (Tiebout, 1956). Fiscal decentralization leads to transparency in public services delivery and a consistent and strong negative association has been observed between decentralization and corruption (Fisman & Gatti, 2002). Through fiscal decentralization revenue and expenditure functions are shifted to the lower tiers bringing government closer to the people which are expected to increase transparency and improve efficiency in public services delivery (De Mello, 2000). Decentralization has a significantly positive relationship with pro-poor social services delivery (Ahmed, 2015). In the absence of good governance and macroeconomic stability, fiscal decentralization results in negative effect on growth, however, in the presence of a better institutional structure, rule of law, transparency, quality bureaucracy and accountability mechanism, it results in enhanced economic growth (Arif & Ahmed, 2020).

Fiscal decentralization has been adopted by both developed and developing countries as a key reform initiative to increase efficiency in public services delivery

and reduce poverty and corruption. Recent decentralization in Kayseri Turkey, has empowered the local municipalities to collect resources and design developmental projects which has resulted in economic development at local level (Ozcan, 2000). Decentralization results in improved technical efficiency in a variety of public services in developing countries including infant mortality (Channa & Faguet, 2016). Decentralization has a positive and significant impact on human development in Indonesia (Daud & Soleman, 2020). Fiscal decentralization has resulted in improved health services delivery and controlling infant mortality in China (Uchimura & Jutting, 2009). Fiscal decentralization in Pakistan can lead to promote pro-poor sectors including healthcare reducing poverty in the country (Ahmed, 2013). Fiscal decentralization, in the long run, has positive impacts on the improvement of public services delivery in Pakistan as it has significantly increased the gross enrolment at primary level in the country (Rauf et al., 2017). The 7th NFC Award supported by the 18th constitutional amendment in Pakistan has empowered the local governments which may address key national issues like regional inequity and lower social indicators (Nabi & Shaikh, 2010). The fiscal distribution arrangements under the 7th NFC award has furthered the cause of provincial autonomy however; benefits of the decentralization couldn't be achieved because of low capacity issues at provincial level (Rehman, Khan & Gill, 2014).

Major objective of the paper is to analyze the implications of additional resources transfer under the 7th NFC Award on health services delivery in Pakistan. The paper also attempts to compare the comparative performance of provinces in health sector in terms of increasing life expectancy, reducing infant mortality rate and under five years' mortality rate. To achieve these objectives data was collected from various sources and various analytical techniques are applied to obtain the results.

The paper comprises introduction, followed by literature review mentioning contribution of the paper. It also includes the methodology covering the tests applied, the variables and sources for data for these variables. It comprises the detail analysis of the data including discussion on the results, conclusion, recommendations and limitation of the studies. Last part of the paper comprises the bibliography.

2. Literature Review

Various studies have been conducted on the subject of fiscal decentralization, further exploring the subject theoretically and on the basis of empirical evidences. Following is the most relevant literature investigating the theory.

Oates (1972) analyzed the concept of efficiency gains as a result of public good delivery under decentralization. This theorem assumes that in case public good is

produced and consumed at various geographical levels and the cost at all levels is equal then it would be more efficient to produce the same good by the subnational government at Pareto-efficient level. Oates's further explained that as demand for goods and services are different from region to region, hence the local governments in comparison to central government, know better about the preferences of the locals and the goods are thus efficiently provided by the local governments.

Brennan and Buchanan (1980) opines that fiscal decentralization may inspire the local governments to provide services to the public efficiently and the trend of competition among the subnational governments may reduce the monopolistic attitude of the government.

Elhiraika (2007) while analyzing the impact of fiscal decentralization on basic service delivery in South Africa finds that fiscal decentralization has improved public service delivery. He argued that due increased accountability and transparency and better responsiveness to local preferences and needs have brought efficiency in services delivery. It is recommended that more fiscal decentralization is essential to improve public service delivery through greater transparency and accountability by the local governments.

Following are some of the by empirical studies conducted on the subject.

Uchimura and Jutting (2009) studied the relationship between fiscal decentralization and health outcomes in China analyzing panel data from 1995 to 2001. Applying the fixed-effect model, the results proved fiscal decentralization as an effective tool to improve the delivery of quality public goods such as healthcare. The results further reveal that fiscal decentralization helps in controlling infant mortality in China. Diaz-Serrano and Rodríguez-Pose (2012) analyzed the data for the year 2002, 2004, 2006 and 2008 about 31 European countries and found a positive impact of fiscal decentralization on education and health.

Channa and Faguet (2016) reviewed the empirical evidence to determine how much decentralization led to enhance matching of public goods offered by the local governments to preferences of the citizens and technical efficiency in the provision of services in health and education sector in developing countries. The study reveals that decentralization leads to enhance technical efficiency over a variety of public services from student test scores to infant mortality. It was further identified that decentralization tends to improve preferences matching in education and in health.

Sow and Razafimahefa (2015) investigated the impact of fiscal decentralization on the efficiency of public service delivery in health and education sectors. Applying a stochastic frontier method to estimate efficiency coefficients the study suggests

that fiscal decentralization, can improve the efficiency of public service delivery and that expenditure decentralization leads to improve efficiency of service delivery in advanced economies whereas it has mixed results in emerging economies and developing countries. It is recommended that strong accountability and capacity building of the local government are essential to ensure productive efficiency.

Olatona and Olomola (2015) studied the impact of fiscal decentralization on public service delivery in Nigeria with special focus on health and educational services from 1999 and 2012. The study finds positive effects on educational service delivery and suggests enhanced revenue autonomy to the states enabling them to meet their expenditure responsibility functions for effective public services delivery.

Ahmed and Lodhi (2013) investigated the impact of fiscal decentralization on education and healthcare using the OLS method on time series and panel data set for all provinces of Pakistan for the period 1975-2009. The empirical results of the study suggest that fiscal decentralization can be effective to improve the delivery and quality of education and healthcare services. The results, however, reflect that the effects of fiscal decentralization on education and healthcare are weaker for Baluchistan and Khyber Pakhtunkhwa as compared to Punjab and Sind where they have a larger better fiscal space and better infrastructure. These findings imply that the provinces can better manage the delivery of social services basic education and healthcare as compared to the central government.

Ahmed (2017), assessed the effectiveness of 7th NFC Award on health in Baluchistan comparing the pre- and post-7th Award scenarios and found less than expected change in the quality and quantity health sector in Baluchistan. The research concludes that health sector in Baluchistan has improved in terms of infrastructure i.e., health budget, number of healthcare facilities, the number of doctors and nurses however, the quality of health services did not enhance in response to the 7th NFC Award. To ensure improvement in health sector in Baluchistan the study recommends that the political influence in the institutions shall be reduced, budget allocations shall be enhanced, salaries shall be raised and best performance shall be rewarded to encourage the employees.

Ahmed and Baloch (2019) examined the impact of fiscal decentralization under 7th NFC Award on healthcare in Baluchistan, Pakistan and infers that despite manifold additional fiscal transfers the quality of services delivery in health sector in Baluchistan did not improve. Notwithstanding a slight improvement in health infrastructure, the overall performance remained stagnant. The fiscal transfers were not supported by widespread reforms and the 'elite capture' as well as widespread corruption was common in the province. The study recommends that political stability coupled with

better governance could lead to better performance in all sectors whereas continuous monitoring would ensure the performance of institutions.

Narmeen, Altaf and Usman (2021) studied Fiscal Decentralization and Quality of Education in Pakistan so as to discover its impact on the quality of education. The secondary source of data was used in order to analyze the quality of education. The paper adopted teacher-student ratio as criteria for measuring of quality of education and finds that the decentralization of revenue greatly helped in the improvement of educational quality. Interestingly, expenditure decentralization did not improve quality of education. The paper suggests that the education needs to be restructured to improve level of education.

3. Contribution of the Paper

Various studies have been conducted on the subject of fiscal decentralization covering its different aspects. However, these studies have partially covered some parts of the whole subject. No pre and post 7th NFC Award analysis has been carried out to identify the net impact of the Award. This study has tried to fill this gape. The paper has specifically focused on the impact of fiscal decentralization under the 7th NFC Award and its subsequent impact on public services delivery. The paper developed a theoretical framework showing the division of period into pre- and post- 7th NFC Award. It is the first ever study that has identified the impact through a pre and post comparison analysis. The results of the pre-NFC and post NFC period are compared to explore if there is any improvement in health services delivery when the provinces were provided with additional funds at their disposal under the historical 7th NFC Award. This is an addition to the available research studies on the subject. Additionally, this paper adopted an experimental approach to compare the performance of the treated groups with the control group. This is another addition to the body of knowledge on the subject. Further studies can be conducted in future with additional data and adding more variables and techniques to explore the impact that has been identified so far under this paper.

Research Methodology

Trend analysis

The following model was developed for trend analysis:

$$Y_t = \beta_0 + \beta_1 \text{Time} + \delta_0 D + \delta_1 D * \text{Time} + \varepsilon_t$$

D = 0 for pre 7th NFC

$D = 1$ for post 7th NFC

Y_t is a dependent variable that will be used to represent an improvement in Health and the regression is estimated by the OLS and the significance of δ_0 and δ_1 is tested using *t*-test, *F* test, and Wald-Coefficient Restriction test.

4. Variables' descriptions

Infant Mortality, Under Five Years' Mortality, Life Expectancy at Birth and Health Expenditures (%GDP) are be dependent or endogenous variables at national level. Similarly, for provincial analysis Life expectancy at birth and Under Five Years mortality would be uses as dependent variables. These variables were selected being standard variables used for measuring the health part of the human development. These variables are used by the UNDP for ranking countries on the basis of Human Development Index (HDI). Additionally, these variables are of impact level and any change from the fiscal decentralization can be better judged at these outcome level.

4.1 Sources of Data

The research study is based on secondary data to be obtained from different official and non-official sources. For indicators at national level data about life expectancy was obtained from Human Development Reports of UNDP (various issues), data regarding infant mortality and under five years' mortality was collected from various reports of UNICEF and UNICEF website. Pakistan Social Living Standards Measurement (PSLM) and various issues of Economics Survey of Pakistan were used to collect data on health expenditure as a percent of GDP. Additionally, the data on subnational indicators i.e. life expectancy and under five years' mortality was collected from the website of globaldatalab.org of the Institute of Management Research, Radboud University referred by the UNDP and Multiple Indicator Cluster Surveys (MICS) (various issues).

Tests:

The following model was used to test the trend and cause and effect relationship among the dependent and independent variables:

$$Y_t = \beta_0 + \beta_1 \text{Time} + \delta_0 D + \delta_1 D * \text{Time} + \varepsilon_t$$

$D = 1$ for post 7th NFC

$D = 0$ for pre 7th NFC

Y_t is a dependent variable, which was used to represent improvement in health

sector. The regression has been estimated by the OLS and the significance of δ_0 and δ_1 was tested. Various tests were applied for trend analysis in the research study. The Chow Breakpoint test has been used to test the stability of the coefficients in two different regression models based on different datasets before and after the 7th NFC Award. It was used to identify whether there is a structural break in the data at a particular point of time i.e 2011 in our case. In the instant case the following models was construct in case of breakpoint:

$$y_t = \beta_1 + \beta_2 x_t + \varepsilon_{1t} \text{ (Before the structural break)}$$

$$y_t = \delta_1 + \delta_2 x_t + \varepsilon_{2t} \text{ (After the structural break)}$$

Recursive Coefficient Test was used to test the stability of the coefficients as more and more data is added. The jumps in the coefficient plots show a structural break as depicted in the postulated equation. In this case the additional flow of funds to the provinces as a result of 7th NFC Award might have some impact upon health indicators in the long run. Trend was estimated to show a change over time and was tested whether the additional funds transfer have any impact on the trend in health variables over the time. Student t-Test has been used for comparing the means of two sample of data i.e. before and after the 7th NFC Award. Wald-Coefficient Restrictions Test was used to test the significance of particular explanatory variables in a statistical model. In this research study the Wald test has been used to test whether the additional funds transfer in light of the 7th NFC Award has contributed to the health sector services delivery in Pakistan. Equality of Variance test was used to check whether variances (variation in data) of the subgroups of data (before and after the 7th NFC Award) are equal or otherwise. Durbin Watson test was applied to test for autocorrelation in the residuals from the regression analysis in the pre and post 7th NFC Award scenario.

Additionally, Difference-in-Difference (D-i-D) estimator was used to compare the performance of Sindh, Khyber Pakhtunkhwa, and Baluchistan as treatment groups against Punjab as a control group. Punjab province is taken as a reference category because changing share of Punjab in vertical distribution was offset by its new share in the horizontal distribution. In this case, the model will become a panel data model for four provinces and the time period is 2000 to 2019:

$$Y_{it} = \beta_0 + \beta_1 Time_t + \beta_2 D_t + \beta_3 Time_t * D_t + \varepsilon_{it}$$

$Time_t$ = Dummy variable before or after the intervention (0 for before and 1 for after)

D_t = Dummy variable for treatment (0 for the control group and 1 for treatment group)

5. Results & Discussion

Table 1: Results of Health Indicators at National level

S#	Technique	Hypothesis	Life Exp	IMR	U5MR	Health/ GDP
1	Chow Breakpoint test for β	Chow Breakpoint test for β Ho: No Breaks at the specific Breakpoints	F= 0.69 (P=0.51)	F= 6.93 (P=0.00)	F= 12.97 (P=0.00)	F= 24.90 (P=0.00)
		Recursive coefficient for β (BP exists?)	Unstable	Stable	Stable	Unstable
2	Wald Test:	$\gamma=\delta=0$ Both Co-eff=0	0.515	0.006	0.000	0.000
3	Change in trend (Dum*trend)	No trend in coefficient: $\delta=0$	P=0.407 D*t=0.012	P=0.002 D*t=0.21	P=0.00010 D*t= 0.39	P=0.0000 D*t=0.09
4	Equality of Variances Test	Variance of both samples are equal.	0.9671	0.0000	0.0000	0.0184
		Ho: no first order autocorr	+ive	+ive	+ive	+ive
5	Coefficient pre	0.07	0.55	0.67	0.22	
	Durbin Watson Test	Ho: no first order autocorr	+ive	+ive	+ive	+ive
	Coefficient post	0.02	0.29	0.29	0.40	
6	Forecasting till 2050	Impact after 2011	No	-ive	-ive	+ive
		Pre Post	75.3 75.4	4 9	-0.6 3	1.1 3.6
7	Trend after 2011	(T-Dum*T)	Imp	Imp	Imp	Imp

Source: Author’s own estimations

We regressed Life Exp, IMR, U5MR and Health GDP on time and then used Chow Breakpoint test to assess whether there was change in trend at the time of implementation of 7th NFC award. The results of Chow tests in the above table show that breakpoints exist in the data for the Development Indicators for Health at national level except for Life Expectancy at Birth. The results suggest that the coefficients are not stable across the period for Infant Mortality (IMR), Under Five Mortality (U5MR) and Health Expenditures as a percent of GDP (H-GDP) whereas the same is stable for Life Expectancy at Birth.

For the same regression of trend, we find recursive coefficients estimates to assess the change in trend and/or level of Life Exp, IMR, U5MR and Health GDP (Slope coefficient represents growth rate of the variables over time while intercept shows the average value of this variable). The results of recursive coefficient suggest that Life Expectancy has been improving continuously, however, the rate of growth has slightly increased since 2010. Thus, it can be concluded that the 7th NFC Award has a positive impact on Life Expectancy in Pakistan.

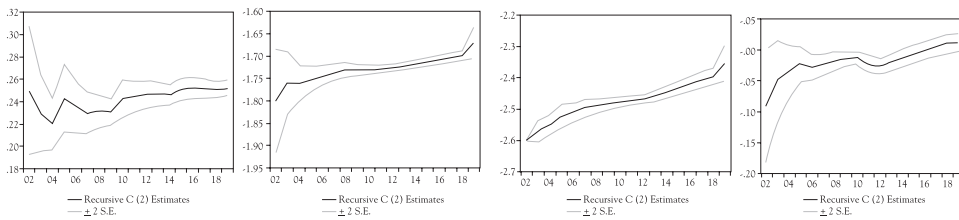


Figure 1: Recursive Coefficient curves for Life Exp, IMR, U5MR, Health Exp-GDP

The rate of Infant Mortality and Under Five Years Mortality has been falling throughout the period, however, rates of fall in both cases have increased since 2012, implying that additional transfer of funds under the 7th NFC Award has contributed towards reducing infant mortality and under five years' mortality in Pakistan. Health expenditures as %GDP steadily increases from 2006 to 2010 but with a reduced rate till 2012 and then sharply increases afterwards, meaning thereby that the national expenditures on health have jumped up as a result of 7th NFC Award.

We also used dummy variable representing 7th NFC award to estimate the change in trend and/or intercept. We then used Wald statistics to test the hypothesis that whether coefficients of dummy variable and interaction of dummy variable and time are significant. The Wald test reflects that both the coefficients representing level shift and trend break cannot be simultaneously zero for IMR, U5MR and Health Exp-GDP therefore they are significantly different from zero, implying that there is a significant change in trend or level of the dependent variables at 2011. For Life

Expectancy, however, there was no change in trend or level.

The values of dummy trend (Dum*trend) show that there is a positive change in trend of the dependent variable for Life Expectancy IMR, U5MR and Health expenditures.

While testing the equality of variance for both the periods it was found that variance of periods before and after the 7th NFC Award are different except for Life expectancy. This test suggests that additional funds transfer thus has substantial impact on variability of IMR, U5MR and Health expenditures but no impact on variability of Life Expectancy.

We also checked persistence in Life Expectancy, IMR, U5MR and Health expenditures and its tendency to change over time using autocorrelation coefficient and corresponding Durbin-Watson statistics. The Durbin Watson tests' results show that there is positive autocorrelation in both the periods for all variables at national level. This implies that inertia in Life Expectancy, IMR, U5MR and Health expenditures remains before and after 7th NFC award. When we measure autocorrelation coefficient then the magnitude of persistence in pre 2011 period is stronger (higher) as compared to post 7th NFC period except for Health-Exp-GDP. This shows that these variables tend to change more frequently in post NFC scenario while inertia has increased, as compared to the pre-NFC era except for Health-Exp-GDP.

Using the same trend regression, we have forecasted the variables till the year 2050 based on their pre- and the post-NFC trends. The forecast in pre- and post-7th NFC scenario, has negligible difference for Life expectancy, insignificantly negative impact for IMR and U5MR. However, the forecast for Health Expenditures is much higher in the post NFC scenario as compared to the pre situation suggesting that health expenditures have enormously increased after the 7th NFC Award.

The trend values suggest that the slope of the trend has improved for Life expectancy, IMR, U5MR and Health-Exp-GDP meaning thereby that the 7th NFC Award has positive impact on Life Expectancy, IMR, U5MR and Health expenditures.

6. Discussion

The above results suggest a mixed response of the variables to the 7th NFC Award. The Life expectancy at birth has been increasing throughout the period under study but the rise become stronger in the post NFC period implying that Life expectancy has improved from 63.91 year (average of pre 7th NFC period) to 66.44 years (average of post 7th NFC period). The Infant mortality and Under Five years' mortality have also shown positive response to the NFC Award and have decreased over the years.

Though the forecast values suggest dismal picture but the overall trend has improved as a result of new fiscal arrangements. Fiscal decentralization results into lower Mortality rate which are particularly important for poor countries (Robalino, Picazo & Voetberg, 2001). The expenditures on health sector have also improved enormously. Thus, we can conclude that overall health indicators at national level have improved as a result of additional funds transfers under the 7th NFC Award. Uchimura and Jutting (2009) also finds that fiscal decentralization as an effective tool to improve the delivery of quality public goods such as healthcare and that fiscal decentralization helped in controlling infant mortality in China.

The provincial governments have been able to spend more resources on health sector through establishment of new health facilities and strengthening the existing health services, thus extending access of the common people to these services. The growing outreach of health facilities have significant impact on the improving access to health facilities in Pakistan. fiscal decentralization has positive impact of health in European countries which leads to influence satisfaction of the people by an effective authority and policy adopted by the subnational government (Diaz-Serrano & Rodríguez-Pose, 2012).

6.1 Health Indicators Provincial level

The variables Life Exp and U5MR were regressed on time and then used Chow Breakpoint test to assess whether there was change in trend at the time of implementation of 7th NFC award. The results of Chow tests show that breakpoints exist in the data for all provinces for Life Expectancy and U5MR implying that coefficients are not stable at the time of 7th NFC Award.

With the same regression trend, we found recursive coefficients estimates to assess the change in trend and/or level of Life Expectancy and U5MR (Slope coefficient represents growth rate of the variables over time while intercept shows the average value of this variable). The results show that Life Expectancy has been improving continuously at increasing rate since 2007 and starts falling from 2016, 2014 and 2013 for Punjab, Sindh and KP respectively, however, the fall is sharp in case of KP. On the contrary, the life expectancy has been falling continuously for Baluchistan till 2014 and then starts rising sharply, meaning thereby that the 7th NFC Award has successfully contributed to increase life expectancy in Baluchistan. Thus, it can be concluded that the additional funds transfer under the 7th NFC Award has positive impact on improving life expectancy generally but for Baluchistan particularly. However, life expectancy in Khyber Pakhtunkhwa did not respond positively to the new fiscal arrangement and additional funds transferred were not translated to improve life expectancy. The Under Five Years Mortality rate for Punjab has been decreasing

4	Equality of Variances Test	Variance of both samples are equal.	0.00	0.27	0.30	0.26	0.91	0.00	0.04	0.05
		Ho: no first order auto-correlation	+ive	+ive	+ive	+ive	+ive	+ive	+ive	+ive
5	Durbin Watson Test	AutoCorr Coefficient before	0.81	0.85	0.87	0.93	0.91	0.74	0.86	0.77
		Ho: no first order auto-correlation	+ive	+ive	+ive	+ive	+ive	-ive	+ive	+ive
6	Forecasting till 2050	AutoCorr Coefficient after	0.60	0.05	0.51	0.20	0.41	-0.02	0.12	0.24
		Impact after 2011	+ive	+ive	-ive	+ive	-ive	+ive	+ive	+ive
		Pre	72.5	40	78	31	77	28	70	132
		Post	74.3	-4	72.6	0	69	33	77	-58
	Trend after 2011	(T-Dum*T)	dec	dec	dec	dec	dec	dec	Inc	Dec

Source: Author's own estimations

continuously till 2012, then become stable and starts decreasing again since 2014 showing positive results of the Award. Whereas for Sindh and Khyber Pakhtunkhwa, the U5MR continuously falls since 2007 at even rate, though the rate of fall is sharp in case of Sindh. For Baluchistan the U5MR falls at increasing rate since 2007 till 2012, then becomes stagnant and starts decreasing since 2014 but at decreasing rate. Though the rate of fall is stagnant for a long period for all provinces but we can conclude that the 7th NFC Award has contributed towards reducing under five years' mortality rate in Punjab, Sindh, Khyber Pakhtunkhwa and Baluchistan. Dummy variable representing 7th NFC award was used to estimate the change in trend and/or intercept. We then use Wald statistics to test the hypothesis that whether coefficients of dummy variable and interaction of dummy variable and time are significant. The results of Wald test suggest that the coefficients before and after 7th NFC Award representing level shift and trend break cannot be simultaneously zero and are significantly different for all the variables for all provinces, showing a significant and negative change in trend or level of the Gross Enrollment, Literacy Rate, Life Expectancy, U5MR, Employment to population ratio and GNI per capita with few exceptions. The results for U5MR for KP and Life Expectancy for Baluchistan show significant and positive change. The results of Employment to population ratio for Punjab and Baluchistan and Literacy Rate for Baluchistan only intimate insignificant change in coefficients, suggesting that there is no change in trend or level for these variables.

The values of coefficient of dummy variable for trend (Dum*trend) show that there is a change in trend of the variables i.e. Life Expectancy and U5MR for all provinces. The values of Dum*t are show negative trend for all variables except for U5MR for KP and Life Expectancy for Baluchistan.

While testing the equality of variance for both the periods for Punjab province it was found that variance of periods before and after the 7th NFC Award are different for Life expectancy but similar for U5MR. The test suggests that additional funds transfer thus has substantial impact on variability of for Life expectancy but no impact on U5MR. In case of Sindh province, variances for all variables for both the periods are different suggesting that additional funds transfer thus has substantial impact on variability of both variables. The variances, in case of Khyber Pakhtunkhwa are different for Life expectancy and similar for U5MR. The results suggest that additional funds transfer thus has substantial impact on variability of for Life expectancy and no impact for U5MR in Khyber Pakhtunkhwa. Similarly, for Baluchistan the variances are equal for both variables suggesting no impact on variability for Life expectancy and no impact for U5MR.

Persistence in the variables and its tendency was also checked to change over time using autocorrelation coefficient and corresponding Durbin-Watson statistics. The

Durbin Watson tests' results show that there is positive autocorrelation in both the periods for Life Expectancy and for all provinces for all provinces except for U5MR for Khyber Pakhtunkhwa. This implies that the successive values in both the periods i.e., pre and post 7th NFC are correlated and inertia remains there before and after 7th NFC award. However, when we measure autocorrelation coefficient then the magnitude of persistence in pre 2011 period is stronger (higher) as compared to post 7th NFC period for all variables of all provinces. This shows that tendency of the variables to change has increased, while inertia has increased in the post NFC Award period.

Using the same trend regression, we have forecasted for the variables till the year 2050 based on its pre- and the post-NFC trend. The forecast in the pre- and post- 7th NFC Award situation for Punjab suggests forecast for life expectancy and U5MR suggest positive effect and better situation in the post NFC Award case. In case of Sindh province, the forecast in the post award situation is lower for life expectancy suggesting poor response to additional funds flow except for U5MR. While comparing the forecast figures for Khyber Pakhtunkhwa we found that it has deteriorated for Life Exp whereas improved for U5MR. The forecast for Life Expectancy for KP is worse in the post NFC scenario. In case of Baluchistan the forecast improves for Life Expectancy and U5MR.

The trend values suggest that the slope of the trend has decreased for all variables of all provinces in the post 7th NFC award situation except for Life expectancy for Baluchistan.

6.2. Discussion

The additional funds transfer has no substantial impact on Life expectancy in all provinces except for Baluchistan where the fall has stopped and improvement has been seen after 2014 but still far from improvement. Health sector in Baluchistan has improved in terms of infrastructure i.e., health budget, number of healthcare facilities, the number of doctors and nurses however, the quality of health services did not enhance in response to the 7th NFC Award (Ahmed 2017). For KP the rate of change in Life expectancy is either stagnant or decreasing in the post 7th NFC Award period. Thus, Under Five Years mortality rate has responded favorably to the additional funds transfer under the new Award and all provinces have improved the U5MR. The effects of fiscal decentralization on healthcare are weaker for Baluchistan and Khyber Pakhtunkhwa as compared to Punjab and Sind where they have larger better fiscal space and better infrastructure (Ahmed & Lodhi, 2013).

6.3 Difference-In-Difference Method

The difference-in-difference approach has been used to analyze the rate of change in coefficients of control groups and treatment groups. While announcing the 7th NFC Award substantive changes were made in the fiscal regime by reducing the percentage share of the Punjab province in the divisible pool but at the same time the share of federation was reduced drastically. The share of the federal government in the divisible pool was reduced from 45% to 44% in year 01 and then 42.5% onwards. The share of Punjab in the divisible pool reduced from 57.37% to 51.74% in the 7th NFC Award. Hence the impact of fall in Punjab share was upset by the increase in share of provinces in the divisible pool. With this background Punjab has been taken as a control group whose share has not been affected by the dual factors already mentioned. On the other hand, the three provinces i.e Sindh, Khyber Pakhtunkhwa and Baluchistan received additional funds under the new award as under the new Award their share in the divisible pool was increased and hence are treated as treatment groups. The data in below table compares the change in coefficients of the variables of Sindh, Khyber Pakhtunkhwa and Baluchistan against Punjab to assess the real impact.

Table 3: D-I-D Results

Sindh	Life Exp			IMR		
	Pre	Post	Difference	Pre	Post	Difference
Control	63.11	65.66	2.55	88.38	80.23	-8.15
Treatment	63.25	66.74	3.49	80.69	67.34	-13.4
	0.14	1.08	0.94	-7.69	-12.9	-5.20
KP	Life Exp			IMR		
	Pre	Post	Difference	Pre	Post	Difference
Control	63.11	65.66	2.55	88.38	80.23	-8.15
Treatment	66.25	68.90	2.66	64.91	55.63	-9.3
	3.13	3.24	0.11	-23.4	-24.6	-1.13
Baluchistan	Life Exp			IMR		
	Pre	Post	Difference	Pre	Post	Difference
Control	63.11	65.66	2.55	88.38	80.23	-8.15
Treatment	67.46	65.85	-1.61	57.90	80.42	22.5
	4.34	0.19	-4.16	-30.5	0.19	30.67

Source: Author's own calculations

The results of the Difference-in-Difference technique given in the above tables suggest that health indicators have improved more in treatment group i.e Sindh as all the three variables viz Life expectancy (0.94), Infant mortality rate (-5.20) and under five mortality rate (-3.25) have improved in the post NFC period. So, Sindh has dedicated more funds to the health sector and access to health services has improved. KP has improved the Life expectancy by a marginal rate of 0.11 and IMR by -1.13 but lag behind by 6.19 in reducing U5MR as compared to Punjab. However, the pre and post difference in U5MR for KP is better. So, we can conclude that KP has benefited from the additional funds transfer and health indicators have improved a lot though the comparative position under U5MR is weaker. While comparing Baluchistan as treatment group with Punjab as control group we find that in Baluchistan health indicators also have got worsen in the post NFC award period as the gap between the control group and treatment group has widened in all the three variables i.e. Life expectancy reduced by 4.16, IMR increased by 30.67 and U5MR by 34.53. Surprisingly, the performance in the three variables have deteriorated in the post NFC scenario. It is concluded that Baluchistan did not take step to improve health services in the province despite receiving unprecedented additional funds. This can be attributed to lack of political will and administrative inefficiencies that the additional funds could not improve lot of the people. In order to achieve macroeconomic stability, the government policies should focus on careful macroeconomic management, efficient resources utilization and address the major factors impeding the process economic growth (Arif & Ahmed, 2020).

7. Conclusion

Health sector at national level, on the other hand, has improved as a result of 7th NFC Award as most of the variables have responded positively. The Life expectancy has increases, Infant mortality and Under Five years' mortality have decreased in the post NFC period. Expenditures on health sector have also improved enormously. Thus, we can conclude that overall health indicators at national level have improved as a result of additional funds transfers under the 7th NFC Award.

Health sector at provincial level has mixed response to the additional funds transfer and has partial impact on Life expectancy in all provinces. In Baluchistan the fall has stopped and improvement has been seen after 2014, however, the growth rate is still less than the pre-NFC period. For KP the rate of change in Life expectancy is either stagnant or decreasing in the post 7th NFC Award period. Thus, Baluchistan got benefited from the additional funds transfer by stopping the downwards slide in life expectancy. Under five years' mortality rate has responded favorably to the additional funds transfer under the new Award and all provinces have improved the U5MR.

Hence, the provinces have been able to reduce the U5MR in the post 7th NFC period.

Under the difference in difference approach Sindh has proved to improve health indicators including Life expectancy, Infant Mortality Rate and Under Five Mortality Rate. Khyber Pakhtunkhwa has improved the Life expectancy and IMR but lagged behind in reducing U5MR when compared with Punjab as control group. However, the pre and post difference in U5MR for KP is better. So, we can conclude that KP has benefited from the additional funds transfer and health indicators have improved a lot though the comparative position under U5MR is weaker. In Baluchistan health indicators have did not improve in the post NFC award period in comparison to Punjab and all the three variables i.e. Life expectancy IMR and U5MR have deteriorated. It is concluded that Baluchistan did not bring substantial improvement in health services despite receiving unprecedented additional funds. This can be attributed to lack of political will and administrative inefficiencies that the additional funds could not improve lot of the people.

7.1 Recommendations

Though health indicators have responded positively to the additional funds transfer to the provinces under the 7th NFC Award, however, performance of the sector can be further improved through various measures. The provincial governments should develop long and short terms policies and plans, setting targets with timelines and develop strategies to achieve those targets. The additional flow of funds put pressure on the government machinery as it involves development of new ideas, preparation of project documents and subsequent steps for their implementation. Hence, the capacities of the government officials need to be enhanced so as the fruits of fiscal devolution are achieved. Based on the socio-economic indicators and public demands each provincial government should set its priorities for future investment. Each province should review it existing administrative and legal framework and come up with a system conducive for the launching of new programs and projects. Private sector can be provided with various incentives to deliver various services through public private partnership or establishment of companies with administrative and financial independence and an effective management structure. The provincial governments shall ensure transparency and accountability in government institutions to achieve the desire results of plans and programs.

7.2.Limitation of the Research

The study has some limitations like other research studies. It did not consider the fragile geo-political situation in the country during the post-7th NFC Award period and continuous menace of militancy which affected every sphere of life. The data on

variables at national level was available from different sources, however, the data on subnational indicators like Expected & Means Years of Schoolings, life expectancy, Under Five years' mortality etc. was not available from official sources. Additionally, the time period for the analysis of the impact was twenty years spreading over 11 years before and 9 years after the 7th NFC Award. Most of the variables are impact level variables and may need more time to assess the impact over the years. Moreover, as the data on various variables is collected periodically hence, interpolated and extrapolated data was used for analysis purpose. The 7th NFC Award was announced in the year 2009 which was implementable in the financial year 2010-11. However, the country wide historical flood of July 2010 inflicted huge losses as major infrastructure was damaged and millions of people were affected. Resultantly, the development expenditures were cut down to spare funds for the relief, rehabilitation and reconstruction. Sharp decline in development expenditures in first two years of the PTI government led to very poor forecast in 2050, in most cases.

References

- Ahmed, M & Lodhi, A. (2013). Impact of Fiscal Decentralizations on Education and Healthcare Outcomes: Empirical Evidence from Pakistan. *Journal of Applied & Emerging Sciences* 4(2), 122-134.
- Ahmed, M. & Baloch, A. (2019). The impact of fiscal decentralization through 7th NFC award on healthcare and basic education in Baluchistan, Pakistan. *International Journal of Applied Business and Management Studies*, 4(2), 1-30.
- Ahmed, M. (2015). The Political Economy of Decentralisation and Access to Pro-poor Social Services Delivery in Pakistan. *The Pakistan Development Review* 54(4),471-486.
- Ahmed, M. (2017). The Effectiveness of 7th National Finance Commission Award on Health and Education Outcomes: A case study of Baluchistan, Pakistan. Retrieved from <http://www.aerc.edu.pk/wp-content/uploads/2017/11/Manzoor-presentation-for-AERC-conference2017.pdf>
- Ahmed, M. (2013). Fiscal Decentralisation and Political Economy of Poverty Reduction: Theory and Evidence from Pakistan, Durham University. Retrieved from <http://etheses.dur.ac.uk/7288/>
- Arif, U. & Ahmed, I. (2020). A framework for analyzing the impact of fiscal decentralization on macro-economic performance, governance, and economic growth. *The Singapore Economic Review* 65(1), 3-39.
- Bahl, R. & Martinez-Vasquez, J. (2006). Sequencing Fiscal Decentralization. *The World Bank, Policy Research Working Paper* 3914.
- Bird, R. M. & Smart, M. (2002). Intergovernmental Fiscal Transfers: International Lesson for Developing Countries. *World Development*, 30 (6), 899-912.
- Brennan, G., & Buchanan, J. M. (1980). *The Power to Tax* Cambridge: Cambridge University Press

- Channa, A. & Faguet, J. (2016). Decentralization of health and education in developing countries: a quality-adjusted review of the empirical literature. *World Bank Research Observer*, 31(2):199-24. Retrieved from <http://eprints.lse.ac.uk/68719/>
- Diaz-Serrano, L. & Rodríguez, P. (2012). Decentralization, Subjective Well-Being, and the Perception of Institutions. *Kyklos* 65(2), 179-193.
- Daud, N. & Soleman, R. (2020). Effects of fiscal decentralization on economic growth and human development index in the Indonesian local governments, *Management Science Letters* 10(16), 3975-3980.
- De Mello, L., R., Jr. (2000). Fiscal Decentralization and Intergovernmental Fiscal Relations: A Cross-Country Analysis, *World Development* 28(2), 365-380.
- Elhiraika B., E. (2007) Fiscal Decentralization & Public Service Delivery in South Africa. *ATPC Work in Progress No. 58*, African Trade Policy Centre, Economic Commission for Africa.
- Fisman, R. & Gatti, R. (2002). Decentralization and corruption: Evidence across Countries. *Journal of Public Economics*, 83 (3), 325-345.
- Uchimura, H. & Jutting, J.P. (2009). Fiscal Decentralization, Chinese Style: Good for Health Outcomes? *World Development*, 37(12), 1926-1934.
- Nabi. I. & Shaikh, H., (2010). Fiscal Federalism in Pakistan: A Radical Departure and Some New Challenges. DPRC Working Paper, Lahore University of Management Sciences.
- Neyapti, B. (2004), Fiscal Decentralization, Central Bank Independence and Inflation, a panel investigation. *Economics Letters*, 82(2), 227-230.
- Narmeen, N., Alraf, S. & Usman. S. (2021). Fiscal Decentralization and Quality of Education in Pakistan. *Journal of Contemporary Macroeconomic Issues* 2 (1), 58-66.
- Oates, W. E. (1972). Fiscal federalism. New York: *Harcourt Brace Jovanovich*
- Ozcan, G. B. (2000). Local Economic Development, Decentralization and Consensus Building in Turkey. *Progress in Planning*, 54(4), 199-278.
- Olatona, J.B. & Olomola, P.A., (2015). Analysis of Fiscal Decentralization and Public Service Delivery in Nigeria. *Journal of Economics and Sustainable Development* 6 (9), www.iiste.org ISSN 2222-1700
- Rehman, S. Khan, N. & Gill, S. A. (2014). Fiscal Decentralization in Pakistan: 7th NFC Award as Case Study. *Public Policy and Administration Research* 4(6). 81-87
- Rauf, A., Khan, A. A., Ali, S., Qureshi, G. Y., Ahmad, D., & Aanwar, N. (2017). Fiscal Decentralization and Delivery of Public Services: Evidence from Education Sector in Pakistan. *Studies in Business and Economics* 12(1), 174-184.
- Robalino, D. A., Picazo, O. & Voetberg, A. (2001). Does Fiscal Decentralization Improve Health Outcomes? Evidence from a Cross-Country Analysis. <https://ssrn.com/abstract=632632>

Sow, M. & Razafimahefa, I., F. (2015). Fiscal Decentralization and the Efficiency of Public Service Delivery. *IMF Working Paper 1559*. Washington: IMF Fiscal Affairs Department. <http://www.imf.org/external/pubs/ft/wp/2015/wp1559.pdf>

Tiebout, C. M., (1956). A Pure Theory of Local Expenditures. *Journal of Political Economy*, 64(5), 416-424.