DECENTRALISATION'S EFFECTS ON HEALTH: THEORY AND EVIDENCE FROM BALOCHISTAN, PAKISTAN

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ABSTRACT

This paper aims to investigate the impacts of decentralisation on health in Balochistan: How decentralisation has been [in] effective in improving (worsening) the overall healthcare services in the province. We analysed various dimensions of intergovernmental fiscal relations of Pakistan vis-à-vis Balochistan in the light of National Finance Commission (NFC) Award – the 7th NFC Award – and the 18th Amendment to examine the effects of decentralisation in Balochistan and to evaluate that how these initiatives have been fine-tuned with policies in Balochistan in terms of healthcare services, as in Pakistan the health is a provincial subject, and steps that help improving the capacity of provincial governments should supposedly translate into better services of healthcare. After the 7th NFC Award and the 18th Amendment, Balochistan has gained bigger fiscal space and provincial autonomy to improve social services including health. Yet, some precursory evidence suggests that in spite of bigger fiscal space and provincial autonomy, the province has not been able to increase healthcare services with qualitatively better outcomes. The paper examines whether Balochistan has actually enhanced healthcare services and addressed post 7th NFC Award and the 18th Amendment. The study used a long time series dataset from 1975 to 2020 from federal/provincial/district sources on health to provide micro-level evidence of static (or otherwise) outcomes in health corresponding to decentralisation. The empirical analysis is discussed and analysed in a rigorous theoretical framework that we build where we evaluate how public health may be provided with better quality and quantity in a decentralised setup, comparing it with centralised setup, considering various institutional types in the same regimes. The model compares the public health provision by provincial/subnational government with centralised government to assess which tier is more effective (or otherwise) in health care provision under what conditions. The empirical evidence is based on the ARDL regression approach, and the findings show that decentralisation has no effect on improving health outcomes (life expectancy and the rate of fully immunised children), but rather causes an increase in infant mortality in Balochistan. Interestingly, per capita health expenditure, dispensaries per population, and regional healthcare centres play an important role in determining the children's immunisation rate and life expectancy rate in Balochistan. However, the absence of doctors has an adverse impact on all types of health outcomes across the province, which indicates that inefficiencies in the provision of health services by local and provincial governments, which remain dysfunctional more often than not, appear to be more impactful.

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INTRODUCTION AND BACKGROUND

Decentralisation is one of the most widespread policy reforms in the world. It is currently being pursued, or was recently implemented, in all of the world's regions, across political systems and income brackets. The World Bank estimated that decentralisation was happening in 80-100% of the world's countries (World Bank, 2012). The interest on decentralisation has only grown in the new millennium, with new or deepening reforms announced in countries as diverse as Bolivia, Pakistan, Cambodia, France, Japan, Kenya, and Turkey, to name just a few (Faguet and Pöschl 2015, Hooghe and Marks 2016, Rodden 2006, Ahmed and Baloch, 2019).

The academic response has similarly been bountiful, with hundreds of articles published across the geography, economics, political science, development studies and public policy literature. For understandable reasons of data, funding, and policy interest, most of these studies focus on the high-income countries of the OECD. But most of the world's 190+ countries, and hence most of the world's decentralisation, lie outside this thirty-six-nation club.

Schultz (2004) defined decentralisation as the shifting of obligations, authority and resources from a centre (federal) to regions/provinces to have a more viable policy planning in financial and administrative affairs, and better services delivery. It also has different forms, such as administrative, political, fiscal and market decentralisation, for each kind of decentralisation carries its own various features, policy repercussions and circumstances for achievement. Hence one can observe various economic, political and other reasons behind the upsurge of decentralisation reforms, and the reasons vary considerably across countries. Decentralisation is considered to be very effective for good governance, bringing improvements in the lives of masses by bringing decision-making processes closer to the people, and enhancing coverage, scope and quality of services delivery. Recent literature on decentralisation indicates that over the past decade, emphasis has shifted away from the analysis of impacts of decentralisation on macroeconomic indicators towards investigating the human face of decentralisation i.e. its impact on the social indicators especially health, and other basic local services.

Pakistan is notably under-represented in the decentralisation literature, and particularly the impacts of decentralisation on the social sector. This paper therefore is an attempt to provide some insights on decentralisation as reform policy in Pakistan. The paper seeks to add to our knowledge about decentralisation by exploring its effects on health in Balochistan, the largest province of Pakistan. In line with modern research, the paper examines and analyses the effects of decentralisation on health in Balochistan in the light of 7th NFC and 18th Amendment to the Constitution of Pakistan, passed and implemented in 2009 and 2010 respectively.

Observing the impact of decentralisation on healthcare and establishing a direct or indirect link (either positive or negative) between these two variables has been and still remains a challenge for both public and development economists. Decentralisation and fiscal federalism should promote human development that is explained by the growth and expansion of people's capabilities and range of choices. Decentralisation should hypothetically contribute to better health facilities and human development, as the provincial governments are supposed to be more responsive and effective – provided that they are better accountable to the local people – than the central/federal government.

According to the 1973 Constitution of Pakistan, and prima further to its 18th Amendment in 2010, health primarily has become a provincial subject. However, planning, finance and administration of health was partially conducted by the federal government of Pakistan in parallel to the provinces. The federal health department used to set the overall policy planning, coordination and standard for primary and tertiary healthcare before the 18th Amendment (Khan and Mirza, 2011). Post 18th Amendment however the core reason of giving health (primary, secondary and tertiary) to provincial governments is to improve the provision and the quality of health. Therefore, it is fair to assume that with more fiscal power to the provincial government through

the 7th NFC Award (we will discuss the 7th National Finance Commission Award and 18th Amendment later in the paper) the provision of health is likely to increase – any steps that help improving the fiscal strengthen (7th NFC Award) and administrative space (18th Amendment) of provincial governments should translate into better services of health. It has been more than a decade since both these initiatives towards decentralisation were taken, so it is logical and feasible to assess how decentralisation initiatives impacted the health sector, which is an important social sector with significant impact on social and economic development. However, to the best of our knowledge, this relationship has not been examined with robust analysis. So, we examine whether or not the access to healthcare facilities and its quality has improved after decentralisation (7th NFC Award and 18th Amendment) in Balochistan.

This research is unique in a sense that it will build a sound theory, bring out novel datasets and possible policy issues related to the subject matter, and can contribute to the existing literature. The study will encourage further policy debate in Pakistan on the role and impact of decentralisation in key social and economic services, while conducting systematic research on health.

Balochistan politically in many ways has invariably been at the forefront of the decentralisation campaign, and much of the sources for this came on the backdrop of poor socioeconomic landscape and backwardness in the province, citing the dearth of resources and autonomy in Balochistan as key cause. Social sector in Balochistan has historically been abysmally poor with weak healthcare indicators, and much of the debate for this weakness of the social sector and limited availability of public health has been on unavailability of resources and lack of administrative autonomy at provincial level. However, both issues to a large extent have been addressed through the 7th NFC Award and 18th Amendment initiatives. Therefore, it is pertinent to examine how and to what extent the province has been successful in addressing its health issues owing to better resource availability and administrative autonomy. Thus, the paper addresses an overarching question: What is the impact of decentralisation on healthcare services in Balochistan? The same question is tested using the following hypothesis: Decentralisation, owing to the 7th NFC Award and 18th Amendment, leads to more expenditure/investment on health in Balochistan, which translates into better healthcare related facilities and outcomes thereof.

LITERATURE REVIEW

2.1 Decentralisation

In 1945 Australia, Canada, Switzerland and the USA were the only functioning federal countries in the world, whereas in 2015, 20 to 30 countries with 40% of the world's population are federal (Anderson, 2015). 95% of the democratic countries have elected regional or local governments with different levels of fiscal, administrative and political decentralisation (World Bank, 2018). Sub-national governments in some countries (the USA, Canada, Switzerland, Pakistan and India) are more autonomous while in many other countries (Thailand, Spain, Indonesia and Chile) they exercise only a restricted autonomy (Hooghe and Marks 2016). Several developing countries have adopted decentralisation as policy strategy to resolve many compelling political and fiscal problems, as well as improving the social and economic services delivery (Bird, 1993).

But what is decentralisation all about? Certainly, it is hard to give a precise definition of decentralisation. Fesler (1965) considers that decentralisation is rich with conceptual and empirical significance that reflects the dynamic political and fiscal realities, and incremental changes of a society. Many scholars believe that the problems related to decentralisation are purely conceptual, and ironically in many developing countries it is proposed and implemented without the true meaning and spirit that it commands (Fantini and Gittell, 1973; Rondinelli, 1981). Therefore, decentralisation is used differently in different contexts with distinctions among fiscal decentralisation, political decentralisation, administrative decentralisation, deconcentration, delegation and devolution (Martinez-Vazquez 1998; Litvak and Seddon, 1999).

Fiscal decentralisation is broadly defined as the transfer of fiscal decision-making and the authority of planning and management of public functions from central government to subnational governments (regional/provincial/local). It encompasses four important elements that are commonly referred to as the key pillars of fiscal decentralisation: 1. transfers of expenditure responsibility to subnational governments; 2. revenue raising authority to subnational governments; 3. the intergovernmental fiscal transfers; and 4. borrowing power to subnational/provincial governments (Bahl, 2006). The advocates of expenditure decentralisation assert that because of the absence of significant spill-over effect, the provision of public goods and services by subnational governments increases the efficiency (Oates, 1968 and 1972; Ostrom et al. 1993; Qian and Weingast, 1997) and ensures national unity (Litvack et al., 1998).

Under *political decentralisation* subnational governments are given certain political authority within the constitutional framework set by the central government. Political decentralisation largely reflects the power of the subnational governments to allow regional political parties to participate in the electoral process, strengthening the legislature, promoting and protecting the local public interest groups (Litvack and Seddon, 1999).

Administrative decentralisation refers to the transfer of administrative authority, particularly over the control of local bureaucracy, implementation of local services provision and financial management to subnational level. Administrative decentralisation aims to empower the subnational governments to deal with their local affairs under a local regulatory framework.

2.2 The Process of Decentralisation in Pakistan

Like many countries, in Pakistan besides other political motives, decentralisation is adopted mainly to promote the efficiency of various tiers of government in social services delivery and governance. Besides empowering the provinces in terms of finance and administrative controls, the decentralisation is likely to enhance the harmony and coordination among the provinces and the third tier of governments (the local governments), strengthening the overall federal structure.

Pakistan has historically been a centralist federation with a centralised system of taxation, in which the federal government collects the majority of tax and non-tax revenues and distributes them vertically – between the centre and the provinces, and horizontally – among the provincial governments based on four criteria – population, poverty, revenue generation and inverse population density. This indicates the imbalanced structure of public finance of Pakistan, where the federal government dominates in revenue collection in comparison to conducting the public sector expenditures. Having this mismatch, the intergovernmental transfers have become an imperative and important tool in meeting the resource requirements of sub-national governments. The intergovernmental resource transfer, a significant feature of provincial governments' finances in Pakistan, takes place under the fiscal arrangement of the (NFC) Award. As mandated by the Constitution, after every five years the President of Pakistan constitutes an NFC Award that prescribes a formula-based fiscal resource distribution and sharing of taxes between the federation and the provinces and among the provinces.

Table 1 portraits the share of provincial governments in various resource sharing Awards. Though there have been 12 Awards in total since the independence of Pakistan, only 7 could amicably conclude their final recommendations. The data presented in table 1 show that the resource transfers trend has been increasing since the Raisman Award – from 12.8% in 1951 to 56-57.5% in 2009. With the exception of the 1974 Award, and the following two inconclusive Awards (1979 and 1985), which replicated the 1974 Award, the share of provinces in the divisible pool, has consistently been increasing. This, therefore, testifies that the country has gradually, albeit very slowly, moved towards decentralisation.

Table 1: Revenue Sharing Arrangement Under Various Awards

Divisible Pool	(Raisman) NFC Awards											
	51	61	64	70	74	79	85	91	97	02	2006	2009
Income Tax and Corporation Tax	50	50	65	80	80	80	80	80	37.5	37.5	41.5 - 46.25	65 - 57.5
Other Direct Taxes									37.5	37.5	41.5 - 46.25	65 - 57.5
Sales Tax	50	60	65	80	80	80	80	80	37.5	37.5	41.5 - 46.25	65 - 57.5
Excise Duty				80								
Tea	50	60	65								41.5- 46.25	65 - 57.5
Tobacco	50	60	65	80				80			41.5 - 46.25	65 - 57.5
Sugar											41.5 - 46.25	65 - 57.5
Betelent	50	60	65	80							41.5 - 46.25	65 - 57.5
Export Duties									37.5	37.5		
Cotton		100	65	80	80	80	80	80				
Jute	50	100	65	80							41.5 - 46.25	65 - 57.5
Import Duties									37.5	37.5	41.5 - 46.25	65 - 57.5
Succession Duties		100		100					37.7	37.7	41.5 - 46.25	65 - 57.5
Capital Value Tax on Immovable Properties		100		100					37.5	37.5	41.5 - 46.25	65 - 57.5
Petroleum Surcharges									100	100	41.5 - 46.25	65 - 57.5
Gas Development Surcharge									100	100	41.5 - 46.25	65 - 57.5
Divisible Pool Transfers as % of Federal Tax Revenue	12.8	23	35	53.4	29.8	29.8	29.8	35	37.3	37.3	41.50 - 46.3	56 - 57.5

Source: NFC Reports (various years*) (Provincial share in %age).*

In the 7th Award the smaller provinces (in terms of population) of Pakistan insisted on the inclusion of indicators like poverty, backwardness, inverse population density, poor

infrastructure tax on services collection in distribution criteria for the horizontal distribution (see Table 2).

Table 2: Distribution Criteria for 7th NFC Award (Share in Percentage)

Indicators	Pop.	Poverty/ Backward	Revenue Generation	Inverse Population Density	Grants for Compensation on account of OZ&T*	Grant for War on Grants for War on Terror**	Share on the basis of previous award	7th NFC Award
Weight	82	10.3	5	2.7			100	100
Punjab	57.37	23.16	44	4.34			53.01	51.74
Sindh	23.71	23.41	50	7.21		0.66	24.94	24.55
KP	13.82	27.82	5	6.54	1.8		14.88	14.62
Balochis	5.11	25.61	1	81.92			7.17	9.09

Source: NFC document (2010) and Nabi and Sheikh (2011)

*Grant-in-Aid to Sindh province is equivalent to 0.66% of the net Provincial Divisible Pool, and is given as compensation for losses on account of abolition of OZ&T.** The grant for war on terror is 1% of the total divisible pool, which is equivalent to 1.8% of the provincial share in the net proceeds of Provincial divisible pool.

In December 2009 the 7th NFC recommended a plausible Award to the prime minister with the consensus of all stakeholders, which may rightly be considered a quantum jump towards decentralisation of resources to provincial governments. The Award introduced some fundamental shifts in both horizontal and vertical distributions:

- It took a drastic step towards decentralisation in Pakistan by increasing the share of the provinces in the divisible pool to 56% in the first year, effective from first July 2010, and 57.5% in the remaining 4 years of the award. In addition, the collection charges, which hitherto had been 5% by the federal government, have reduced to 1%. The federal government also relinquished the sales tax on services under federal excise duties to the provinces (Nabi and Sheikh, 2011).
- Alongside vertical distribution the horizontal distribution has also undergone into a major shift. Besides population, poverty, backwardness, resource mobilisation and inverse population density determined the distribution of resources among the provinces (see table 2). Albeit, population yet remained as the major indicator compare to other included indicators, with 82% weight, against the poverty/backwardness, revenue mobilisation and inverse population density with 10.3%, 5% and 2.7% weight respectively, however, because of the enlargement of the provincial share in vertical distribution the smaller provinces particularly received a big financial relive to consolidate their deteriorating budgetary positions.
- In order to compensate the provinces that faced extraordinary financial difficulties special considerations have been made in this award to deal with it in every fiscal year. It is agreed upon that each province would receive 50% of net proceeds on total royalty on crude oil. Additionally, Balochistan was to receive Rs. 120 billion under the head of the Gas Development Surcharges, which the federal government owed to Balochistan, of the instalment of 12 years. Likewise, KP was to get Rs. 110 billion on the head of hydel profit in 5 years' time (Pakistan, 2010).

The bottom line of the 7th NFC Award is that it recognized the federal spirit of Pakistan and conceded the fact that without greater decentralisation provinces would desperately fail in providing social services like education, healthcare, basic infrastructure, drinking water and sanitation to their respective population, for which they are constitutionally responsible.

2.3 The 18th Amendment to the Constitution

The 18th Amendment to the Constitution of Pakistan passed in April 2010 was a historic amendment that sought to decentralise power in important ways. It devolved several important functions to Provincial Governments by abolishing the Concurrent Legislative List in the Constitution and amending the Federal Legislative List. This decentralisation of responsibility and authority provided the context in which various institutional actors renegotiated their roles in a contested space, and the Provincial Governments' amended laws, established new institutional frameworks, developed policies and strategies and built capacity to effectively discharge their newly acquired responsibilities.

The 18th Amendment abolished the Concurrent List and devolved all subjects including health in the Concurrent List to the provinces. This represents the extended sphere of provincial responsibility and authority. For provinces, it meant two things. First, they were now required to legislate on these subjects, even if this amounted to adopting mutatis mutandis the federal legislation. Hitherto, provinces had mainly relied on the Federal Government for legislation, policy and regulation. But these subjects were no longer legitimate federal business; hence, provinces had to frame their own laws, rules and policies on these matters.

The key structural change brought about by the 18th amendment has been with reference to the nature of decentralisation in Pakistan. Articles 141 to 159 of the constitution delineate the relationship between the federation and the provinces. In this relationship, the difference is that the concurrent list, comprising subjects on which both the national and provincial assemblies could legislate, has been largely done away with. The 18th amendment has therefore created not only the necessary constitutional framework and administrative responsibilities; it also provided a much bigger fiscal space to the provinces to perform all devolved functions. Health was a residual subject and, therefore, fell under the provincial purview.

2.4 Decentralisation and Health

Decentralised authority of the health system was implemented in certain states as a subsection of extensive health reorganisations or as a priority management policy (Rico & Leon, 2005; Saltman, 2007). The rationale of this initiative differs from country to country. In the overall extensive process, health amenities carried a key place (Saltman et al., 2007; Costa-Font & Greer, 2013). Decentralisation, had vigorously been advocated as an effective reform policy for the delivery of public goods, like health care amenities (Robalino & Voetberg, 2001; Asfaw et al., 2007).

The strong demand for health system decentralisation was first raised in the Alma Ata declaration in 1978, which emphasised a greater partaking and community engagement in dealing with their health-related issues. By that period, it was presumed that decentralisation which basically strengthened the community may have brought some improvement for marginalised and disadvantaged communities regarding their health matters, was basically an equity concern (WHO/UNIICEF, 1978). Though decentralisation has come under severe criticism over its potential to let the inequality gap get wider in the provision of services between privileged and underprivileged localities (Collins & Green, 1994).

In the last forty years certain health reforms were undertaken in many countries. As an important component of such restructurings, decentralised authority of the health system has been implemented in many states as a subsection of extensive health reorganisations or as a priority management policy (Rico & Leon, 2005; Saltman, 2007). In this overall extensive process, health amenities carried a key place (Saltman et al., 2007; Costa-Font & Greer, 2013). Decentralisation, had vigorously been advocated as a suitable technique for the delivery of public goods, like health care amenities (Robalino & Voetberg, 2001; Asfaw et al., 2007).

Theoretically, enhanced local responsibilities should be a means for better access to services in the health sector and finally, into an improved health state for the masses (Saltman et al., 2006). A key purpose of sustaining this option is to bring betterment in inclusive health outcomes (Magnussen et al., 2007). It is expected that decentralisation creates the environment for health system to gain technical and allocative efficiency, strengthen local governments, enhance checks and balances, creates a participatory approach as well as get the people closer to decision making process and achieve some improvements in health services (World Bank, 2004; World Health Organisation, 2008; Regmi, 2013; Faguet & Poschl, 2015; Bankauskaite & Saltman, 2007; Regmi et al., 2010).

A review study conducted on decentralisation and health equity reached the conclusion that, as decentralisation creates greater local autonomy between regions, disparities in terms of healthcare will tend to increase (Saltman et al., 2016; Sumah et al., 2016). Moreover, some of the convincing arguments put forward for the decentralisation of the health governance system is a critical reason to bring health services according to the requirements of the indigenous people as well as to enhance accessibility and excellence of well-being (Regmi et al., 2010). The argument has also been advocated in favour of decentralisation that it might result in a more comprehensive reform in terms of economic, political and technical aspects (Litvack et al., 1998). Another argument is neo-liberal transformation of health sector which were initiated with the objectives of, among others, to introduce austerity drives planned to cut state expenditures, minimise the contribution of government in providing health amenities and also introduction of rivalry and price awareness in the government sector (Bossert & Beauvais, 2002; Bossert et al., 2000). Many researchers postulate that all these initiatives were taken to ease the pressure on governments placed by international donor agencies and aid organisations. International organisations and agencies pointed out a ray of inefficiencies and malpractices in the prevailing health system and its subsequent failure in the delivery of sophisticated and excellent health facilities and ease in the accessibility of health care (Ayee, 1996; Jommi & Fattore, 2003).

As already discussed, the empirical work on the association between decentralisation and its effect on health is sparse and invariably mixed and inconclusive. However, some of the country-specific work on the impact of decentralisation /centralisation on healthcare outcomes provide interesting insight. For instance, the relationship between decentralisation and health outcomes is studied by Mahal et al. (2000) in India, Yee (2001) in China, Ebel and Yilmaz (2002) in Argentina, Brazil, Colombia, Philippines, South Africa and Venezuela, and Habibi et al., (2001) in Venezuela show that decentralisation had a significant impact on decreasing infant mortality, lower mortality rates, improved health outcomes and increase regional disparities in health expenditures due to the absence of a mechanism to transfer resources from rich to poor provinces. Strumpf et al., (1999) state that local government health planners allocated declining proportions of their budgets to public service activities. Schwartz et al. (2002), using a panel of middle-income countries to suggest that local public health expenditures increased after decentralisation but, over time, provincial governments decreased the share of revenue allocated to public health. Treisman (2002) points out on the basis of data from the 166 countries that the impact of decentralisation on the percentages of new-born immunised for diphtheria, tetanus and pertussis as well as accessibility for medicines, largely depend on level of income. Asfaw et al., (2007) find an empirically robust and undesirable association between decentralisation and infant mortality rate in India. The same study shows that states with expenditure decentralisation above 17.1% (an average decentralisation index) perform far better in terms of infant mortality rate than states where expenditure decentralisation is less than 17.1%. Khaleghian (2003) tries to find out the impact of decentralisation on vaccination percentage of 1-year-old children from 140 states falling in the category of average and low income per capita in the period of 1980 to 1997. He concluded that decentralisation is only good for less developed countries.

Meher and Samina (2018) conduct a study to analyse the impact of decentralisation in improvement of public services across selected districts of the Punjab, Pakistan, covering the period from 2003 to 2014. The study finds that decentralisation improves the delivery of health

services in many districts in the Punjab. Afteb (2019) examines the impact of decentralisation on the provision of health in Khyber Pakhtunkhwa, Pakistan, to find out a positive impact of decentralisation on the provision of services in health in the province.

A lot of scholarly work showed the not-so-undesirable impact of decentralisation on health outcomes. Yet, these studies indicate that disparity is a big issue regarding decentralisation impacts on health (Collins & Green, 1994; Jommi & Fattore, 2003). Hence, whereas it is expected from decentralisation reform that it may boost up equity, thus far little evidence exists to support this narrative (Koivusalo et al., 2020). Some scholars have emphasised that decentralisation influences health care and makes it imbalanced due to the fiscal and political autonomy of the provinces in the course of assessment, which result into variations in the overall methods to health sector between subnational entities. This assertion nevertheless is forcefully negated by other works, citing that decentralisation would not incline the health system into inequity (see for example, Atkinson & Haran, 2004; Uchimura & Jutting, 2009; Regmi et al., 2010). Hitherto lots of work disclosed that equity outcomes largely depend on existing political set up and policy arena (Alves et al., (2013; Koivusalo, 2017).

The existing diverse opinions in the research works exhibit insufficient empirical outcomes to have a solid assumption upon the influence of decentralisation on health services provision. Thus**,** to draw a solid conclusion whether or not decentralisation leads to better health provision, the existing scholarly works are insufficient due to varying and inconclusive results. In order to further ascertain the impact and (in)efficacy of decentralisation in improving (or otherwise) of health services more systematic work is imperative, this study is therefore an attempt towards this direction.

THE STATUS OF HEALTH IN BALOCHISTAN

Access to basic health services is one of the fundamental human rights accorded by the United Nations. The Universal Declaration of Human Rights (UDHR) declares that everyone has a right to a standard of living adequate for the health and wellbeing of him/her and of his/her family (The UN, Article 25). Pakistan is a member of the UDHR. Pakistan therefore recognizes the importance of health in its Constitution that 'the State shall secure the well-being of all people by raising their standard of living and shall provide basic necessities of life, such as food, clothing, housing, education and medical relief for all such citizens who are unable to earn their livelihood by reason of disease, infirmity or unemployment' (Constitution, 1973).

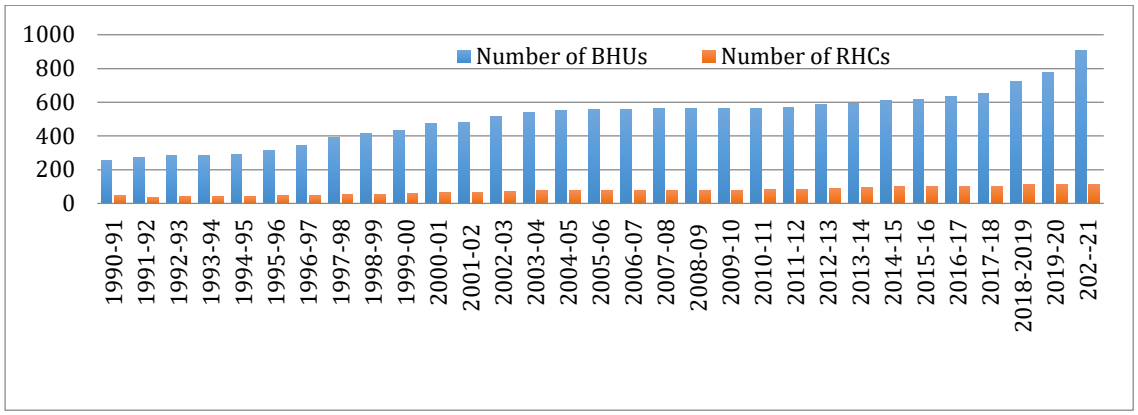
The provision of basic healthcare services in Pakistan is abysmally poor, where a vast majority of the population, particularly the disadvantaged communities are deprived of any access to the basic health facilities. But in Balochistan the situation of basic health services is either non-existent or in very bad conditions. For example, more than 785 pregnant mothers out of 10,000 live with incredible pregnancies with adverse consequences on overall family lives and their earning capabilities in the province. The proportion of mortality in Balochistan is grotesquely high: 600 for each 10,000. New-born children mortality proportion is 128 for each 1,000 inferable from the low capacity of birthing specialists, deficient backing of wellbeing administrations, under age relational unions and wellbeing obviousness (Health Facility Assessment-Balochistan Provincial Report, 2017). The majority of its population in the province (more than 70%) lives in far-flung areas where there is an urgent need of maternity specialists and wellbeing administrations (MICS, Govt. of Balochistan, 2018).

For the past 10 years 11 million children died before reaching the age of five. Maternal rate (MMR) is alarmingly high with 785/100,000 live births while baby death rate (IMR) is 97/1000 live births. Birth by Skilled Birth Attendant is 18%, Birth Offices are 16% and 12-23 month completely inoculated kids are 16%. The province has the highest Infant Mortality Rate compared to other provinces of Pakistan. The infrastructure of the healthcare sector is in dire condition (Government of Balochistan, 2020).

In terms of health facilities and provision of basic health services, primary services play a critical role in any society. The Basic Health Units (BHUs) and Rural Health Centres (RHCs) provide fundamental healthcare services to people in rural areas, where in total 909 BHUs, 103 RHCs and 82 Maternal Child Care Centres (MCHs) in Balochistan are officially registered with an addition to 575 Civil Dispensaries (CDs). Although the physical infrastructure has increased over the times, yet these BHUs, RHCs and MCHs are either closed or dysfunctional in rendering any meaningful services. This is partly because of the non-supply of medicines and other equipment by provincial and district health department(s). The statistics reveal that for the past 10 years 1.1 million children died before achieving the age of five.

In recent years, although the budgetary allocation and physical infrastructure have witnessed an improvement in the province, the already weak outcomes of healthcare have further deteriorated with some of the worst health statistics in the world. For example, there are 2018 professional doctors working in Balochistan, and estimated population in the province is 13.45 million in 2021. The population per doctor is around 6665. As discussed, other facilities including the absolute number of Basic Health Units (BHUs), Regional Health Centres (RHCs), and number of paramedic staff and staff nurses have also increased. This illustrates that overall physical infrastructure and human resources have increased. However, some of the critical health indicators, which are considered to be the barometer to measure overall health outcomes – infant mortality, child immunisation etc. –, have deteriorated.

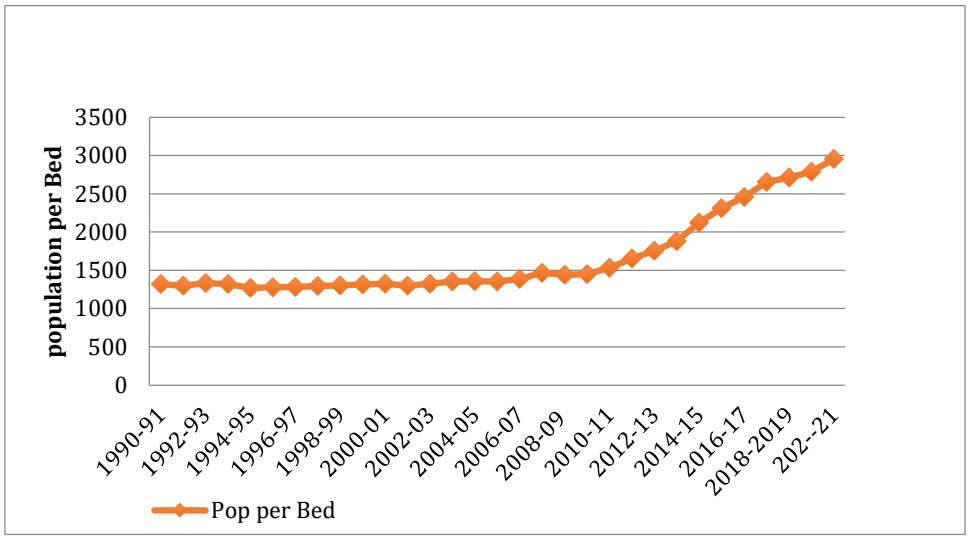
Figure 1: Number of BHUs and RHCs



Source: PPHI, Department of Health, Government of Balochistan (2021).

Whereas, absolute number of BHUs and RHCs has been increasing over the years, as we observe in figure 1, yet absolute increment may not necessarily be enough to cope up with the population growth of 3.37%, which is one of much higher than the national average. Therefore, another important variable to measure the availability of health facilities is population per hospital bed (figure 2). Figure 2 shows the population per hospital bed from 1990 to 2020, where we notice that up till 2010, the year in which decentralisation to provinces took place through the historic 18th Amendment, the statistic of population per hospital per bed remained almost stagnate. However, post 2010, there has been a steep rise in population per hospital per bed, which is indeed surprising, as we discussed earlier in this report that budgetary allocation to the health sector has substantially given the relative fiscal space Balochistan enjoyed owing to the 7th NFC Award.

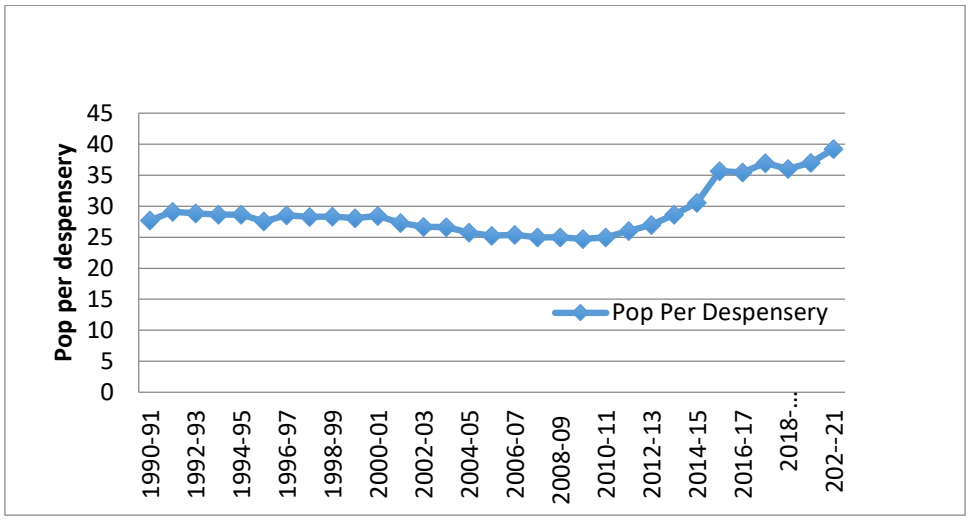
Figure 2: Pop per Hospital Bed



Source: PPHI, Department of Health, Government of Balochistan.

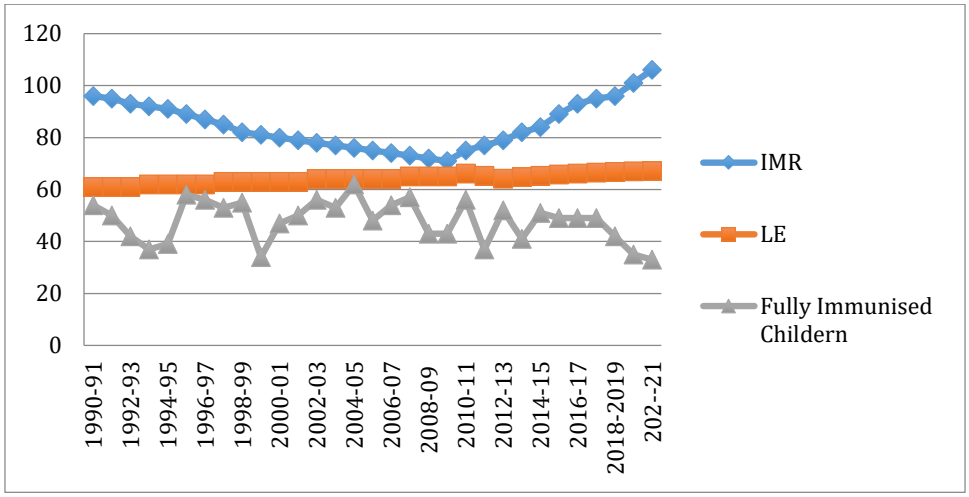
Not only this, population per dispensary, another very critical variable to assess the availability of basic health infrastructure, has also been increasing (see figure 3), which shows that notwithstanding the absolute increase of basic units and other health facilities, yet in relation to population the provision of basic infrastructure lags far behind, therefore we may notice a deterioration of public health provision in Balochistan.

Figure 3: Population per Dispensary



Source: PPHI, Department of Health, Government of Balochistan

Figure 4: Infant Mortality, Life Expectancy and Fully Immunised



Source: Department of Health, Government of Balochistan.

Figure 4 shows three variables, which are crucial to examine the overall status of public health. Figure 4 graphs three variables – infant mortality rate (IMR), life expectancy and children immunisation. As we showed in the literature review section, IMR is widely used as a yardstick to measure the overall public health performance of a society. In Balochistan, the IMR, albeit had shown a persistent reduction till 2009, which may be attributed to many of the exogenous factors, has ironically been increasing since 2009 (figure 4). Similarly, immunisation coverage, another important variable to assess the overall healthcare provision and its impacts on outcomes, has also been shrinking in Balochistan. And life expectancy at birth is just around 58 years, which is far behind the national average.

Thus, the preliminary statistics of health in Balochistan portray a mixed picture. Whereas, in one hand the infrastructure and human resources in health sector – the number of BHUs, RHUs, hospitals, doctors, nurses etc. – have increased over the years, on the other hand, however health indicators like infant mortality rate, children immunisation coverage and proportion of pregnant women with pre-natal care, as we have shown above, have started deteriorating in recent years.

DECENTRALISATION IN BALOCHISTAN

Whereas, the trend of decentralisation, and particularly the fiscal decentralisation, to the provinces from the central government had been increasing prior to the 7th NFC Award and 18th Amendment, as we showed above in table 1, however in 2009 and 2010 when these reforms respectively took place, we noticed a significant decentralisation to the provinces in general and Balochistan in particular. As shown in table 7 (also see Ahmed and Baloch, 2014), post 7th NFC award not only the vertical share of provinces has increased from 41.5%-46.25% to 57.5% to enlarge the overall share of the provinces in divisible pool – which in itself a hallmark of decentralisation, but also in horizontal distribution share of Balochistan has increased from somewhat 5.3% to 9.09%, as more criteria for horizontal distribution along with population, which hitherto had been the sole criterion (table 7).

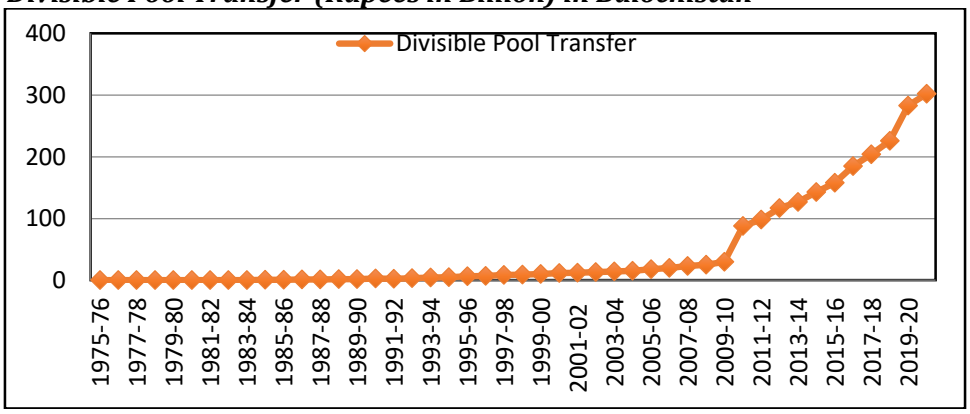
Table 3: Summary of the Provinces Share in NFC Award - 1974 To 2009

NFC Awards	Punjab	Sindh	KPK	Balochistan
NFC Award 1994	60.25	22.5	13.39	3.86
NFC Award 1979	57.97	23.34	13.39	5.3
NFC Award 1885	57.97	23.34	13.39	5.3
NFC Award 1990	57.88	23.28	13.54	5.3
NFC Award 1996	57.88	23.28	13.54	5.3
NFC Award 2000	57.88	23.28	13.54	5.3
7th NFC Award 2009	51.74	24.55	14.62	9.09

Source: national Finance Commission Report, 2009.

Coupled with the 7th NFC Award the second milestone towards decentralisation is the 18th amendment. As already discussed, the 18th Amendment abolished the Concurrent List, devolved several ministries and divisions to the provinces among other major steps towards substantial decentralisation. Post 18th amendment, the provinces therefore started enjoying true autonomy not only in expenditures and revenue raising, but they also have a large "decision space" and much leverage in amending rules, introducing new revenue sources (we will discuss the (in)effective impact of decentralisation on health outcomes in the light of "decision space" theory in second part of the project. As figure 6 shows, expenditure decentralisation has seen a significant increase post 7th NFC award and 18th amendment.

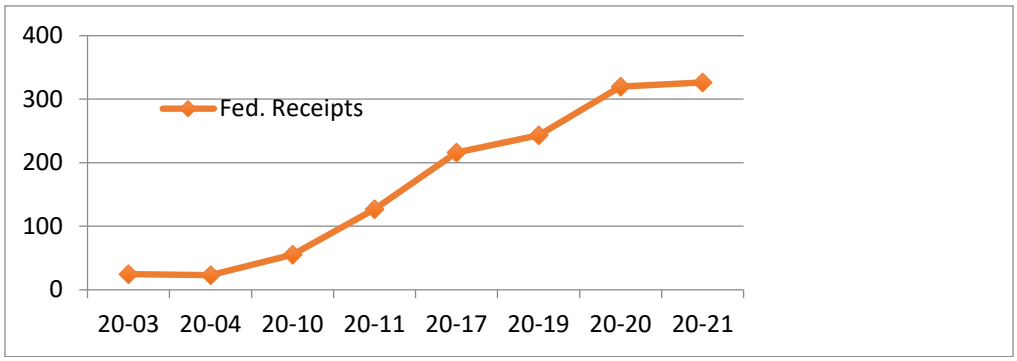
Figure 5: Divisible Pool Transfer (Rupees in Billion) in Balochistan



Source: Budget Documents, Ministry of Finance, Government of Balochistan

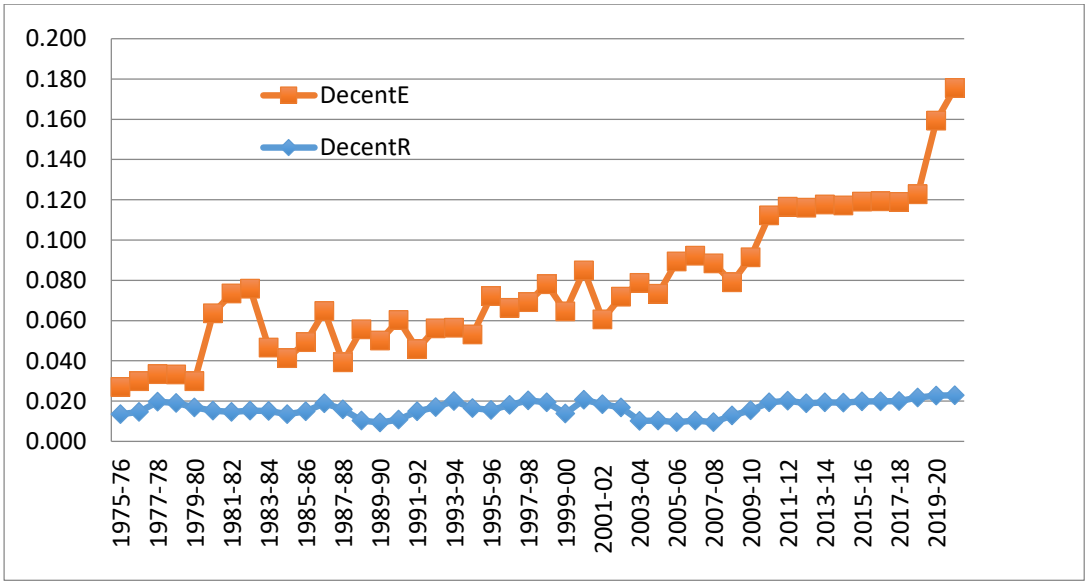
Besides, divisible pool, we also observe a steep rise in federal receipts after 2009-10, the fiscal year the 7th NFC award was implemented (figure 7), which is another illustration of decentralisation in Balochistan.

Figure 6: Federal Receipts (Rupees in Billion) to Balochistan



Source: Budget Documents, Ministry of Finance, Government of Balochistan.

Figure 7: Overall Trend of Expenditure and Revenue Decentralisation in Balochistan – 1975 to 2020



Source: Federal and Provincial Budget Documents (various years; Statistical Year Book, State Bank of Pakistan (2010); Economic Survey of Pakistan (Various Issues).

As we show in figure 8 the expenditure decentralisation to Balochistan has witnessed an increasing trend in general, and post 2009, 2010 when decentralisation reforms were undertaken in form of 7th NFC Award and 18th Amendment, the expenditure decentralisation has displayed a somewhat steep and consistent rise in Balochistan.

The NFC award therefore provided much bigger fiscal space to Balochistan, as it gave a substantially higher share of public resources from the divisible pool and other straight transfers to the province. And the 18th amendment allocated a number of new functions to the provinces, including, of course, Balochistan. The implications of 7th NFC Award are significant in regards to the drive of decentralisation in Balochistan, as intergovernmental revenue transfers are the lifeline of the provincial governments. These transfers account for 89% of the provincial Government of Balochistan. So, it is plausible to argue that Balochistan has realised a meaningful decentralisation after these two initiatives.

The above discussion clearly illustrates that a significant decentralisation – both fiscal and administrative – to the provinces in Pakistan has taken place in recent years. It is pertinent to ask how this fiscal space is being utilised by the provinces to enhance the quantity and quality of key social services provision like health. We carry out an empirical and theoretical (in the second part of the project) to assess how (and why) decentralisation has been effective in impacting the health in Balochistan.

In the following, we will examine how decentralisation has impacted the health sector in Balochistan, not only in terms of financial allocations, but also in improving the overall healthcare infrastructure, human resources availability, and the outcomes, like infant mortality and crude death rate etc.

THE THEORETICAL FRAMEWORK

This section will be devoted to building a model and theoretical framework in which we assess how public health may be provided with better quality and quantity in a decentralised setup considering various institutional types. For the development of the theoretical framework Bardhan and Mookherjee (2005); Besley and Coate (2003); Faguet (2002, 2004); and Ben Lockwood (2006) models are used as benchmarks.

We assume that provinces are better than federal/central government, in other words decentralisation reforms are undertaken in a federal structure, because of the "proximity" and "responsiveness" of the provincial governments to the people's needs. Whereas, we assume that the federal government is more efficient with better governance structure, we call it "technological advantage" in the production/provision of the public goods and services (Faguet, 1991). We construct a model in which the proximity/responsiveness advantage of the decentralisation would be compared to the federal government's technological advantage for the provision of health services.

In order to make the analysis simple we consider two regimes: I) centralised regimes (C), and II) decentralised regimes (D). The centralised regime has one central government without having any provinces or subnational governments; therefore, the central government governs the entire country. In the decentralised regime, there are (k) number of provincial/sub-national governments, in which each government governs its respective jurisdiction. We also assume that every province has two types of inhabitants: poor and rich or non-poor. Further we assume that the inhabitants are immobile among the jurisdictions/provincial boundaries. In other words, they may not fully move from one province/locality to another one.

Let us consider a citizen of a locality, who consumes two baskets: Social services (G) and private goods (N). Algebraically it may be written as:

$$L = f(G, N) \quad \text{.....(1)}$$

Where, (L) is the living condition of the citizen. So, to meet the (L) living condition (G) and (N) amount of goods and services are needed. The social services basket (G), contains also public health provision (H), therefore, (G) is the function of (H) and (X). (X) is the set of public goods/services other than (H).

$$G = G(H, X) \quad \textbf{.....(2)}$$

Whereas, the private services are the ones, which come into the basket of services other than social services. For the sake of simplicity, we assume that those goods and services, which do not come in the necessity category, are non-necessity goods. Thus (N) is determined by all non-basic necessity services/social services, which we denote as (Z):

$$N = N(Z) \quad \text{.....(3)}$$

Furthermore, the living condition argument in (1) equation has the first and second differentiation as:

$$L_G > 0, and\ L_{GG} \leq \mathbf{0} \quad \text{.....(4)}$$

Likewise,

$$L_N > 0, and\ L_{NN} \leq \mathbf{0} \quad \text{.....(5)}$$

The argument is, when the provision of social services (G) increases, the living conditions of the citizen will increase but with the decreasing rate (as shown in equation 4). The same argument is true for private goods (N) in equation (5).

In addition to this, we also assume that each locality/district (k) has a necessity factor, that we characterise as "Basic Need" ($\lambda > 0$). This factor gives knowledge about policy in which (H) and

(Z) are required to ensure basic social services. Since the decentralised regime is nearer to the local population, therefore, we assume that due to the proximity condition, it (decentralised setup) has an advantage in local basic need parameter (λ). On the other hand, the centralised regime has a disadvantage due to its "remoteness" from the population. Therefore, the latter may have the wrong estimation or perception about the actual needs of the people. Thus, putting eq. (3), (4) and (5) together based on the above- arguments, we have the following valuation function:

$$L = f\{\lambda\, G(H), N(Z)\} \quad \text{.....} \quad (6)$$

This function is concave, and increasing with respect to (H) and (Z).

Figure 8: Relationship between Living Standard and Goods Consumption

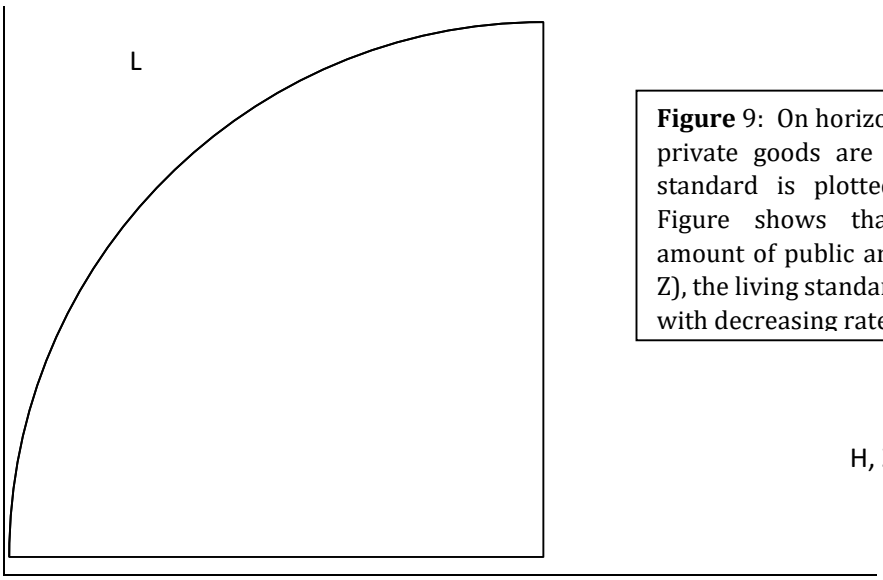


Figure 9: On horizontal axis, public and private goods are plotted. And living standard is plotted on vertical axis. Figure shows that with increasing amount of public and private goods (H, Z), the living standard also increases but with decreasing rate

Henceforth, the total and marginal utility from (G) is increasing in (λ**)**, because of the assumption that the provincial governments better know this "basic need" parameter, and the central regime does not have perfect knowledge about this parameter, therefore, its perception about the local needs may be overestimated or underestimated (Bardhan and Mookherjee, 2005).

5.1 The Budget Constraint

Besley and Coate (2003); Basely and Smart (2003); and Lockwood (2006) use the term "representative government" which represents the majority voters, and provides (H) and (Z). The representatives are to be elected through majority votes. Therefore, to ensure their reelection they try to satisfy the citizens by meeting their requirements.

We further assume that whether it is a centralised or decentralised regime, both have balanced budgets with the (R) amount of Revenue, and (E) amount of Outlay or expenditure. That is:

Revenues = Expenditure, or

Total Taxes = Total Expenditure

$$\tau^i = w(N + G + Z) \quad \text{.....} \quad (7)$$

Where, τ^i is the total tax for all(i), i= 1,2.....n

As was noted earlier there is only one representative government in the centralised setup, and it decides how much of health services (H) to be provided and what should be the level of private good (Z). The federal government is supposed to be better equipped, in terms of technological advancement, for the provision of both goods compared to the decentralised governments. Therefore, (γ) is introduced to incorporate the "technological edge" or cost effectiveness of the

federal government. However, it has disadvantages in terms of remoteness from the local people. Reproducing equation (6) and inserting superscript (i) and (j), we have:

$$L = f\{\lambda^i G(H^j), N(z^j)\} \quad (8)$$

Where J = D (decentralised regime), and C (centralised regime).

Meanwhile, the private consumption of citizen is the function of total number of hours work (w), minus the amount of taxes (τ^i) which they need to pay. Therefore, the private consumption is the function of the citizen is as follows:

$$C^i = V(wL^i - \tau^i) \quad (9)$$

Applying the Lagrange, and putting the equations (7), (8) and (9) respectively, we get our objective function:

$$L = \left\{ \sum_{i=1}^{n} \left(\sum_{i=0}^{n} f[\lambda^i G(H), N(Z) \right) + V(WL^i - \tau^i)] + \theta \left(\sum_{i=1}^{n} \tau^i - WH - WZ] \right) \right\}$$

$$\frac{\partial L}{\partial H} = f_G\, G_P - \theta W = 0 \quad (11)$$

$$\frac{\partial L}{\partial Z} = f_N\, N_Z - \theta W = 0 \quad (12)$$

Equating (11) and (12) equations, we have:

$$\Rightarrow f_G\, G_{H=} f_N\, N_Z = \theta W \quad (13)$$

$$\frac{\partial L}{\partial \tau} = -V_\tau + \gamma\, \theta = 0 \quad (14)$$

$$\theta = \frac{V_\tau}{1} \quad (15)$$

Combining equations (11), (12), and (14), and simplifying, we have:

$$\frac{V_\tau W}{1} = f_G G_P = f_N N_Z \quad (16)$$

Eq. (16) depicts that the proportional tax rate (τ^i) from the (W) is equal to the marginal benefit which is extracted from public goods (H) and private goods (N), respectively. In other words, the marginal benefits from both goods are equal to the marginal cost.

Furthermore, we assume that the function (f) is equal to:

$$f = A\lambda^i G^\alpha N^\beta \quad (17)$$

Where, (A) is a constant, and (α) and (β) are the marginal utility which citizens extract from consuming the basket of public goods and services (G), and basket of private goods (N) respectively.

$$f_G = \alpha\lambda^i G^{\alpha-1} N^\beta \quad (18)$$

$$f_G = \alpha \frac{f}{G} \quad (19)$$

$$f_N = \frac{f}{N}(\beta) \quad (20)$$

Furthermore, we assume that:

$$C = ln\ ln\ (WL - \tau^i) \quad (21)$$

Since it is earlier noted that ($\theta = V_t$), therefore substituting (21) for (V), the eq. (15) becomes:

$$\theta = \frac{V_\tau}{\gamma} = \frac{-1}{WL-\tau} \quad (22)$$

$$\theta WL - \emptyset\tau = -1 \quad \text{.....(23)}$$

$$\tau^i = \frac{1+\emptyset WL}{\theta} \quad \text{..... (24)}$$

Thus (τ^i) amount of tax is needed per head to finance for the provincial level of public goods and services in either type of government.

Combining equations (11), (12), and (21) we obtain:

$$-\frac{W}{\gamma(WL-\tau^i)} = \frac{f}{G^\alpha} * \frac{\partial G^\alpha}{\partial H} = \frac{f}{N^\beta} * \frac{\partial N^\beta}{\partial Z} \quad \text{..... (25)}$$

The above-equation depicts the trade-off between a basket of private good (N) and a basket of public goods/social services (G), that citizens get from given level of tax rate (τ^i), which they have to pay as a proportion of wage rate (W).

Figure 9: Trade-off between Public Good and Private Good

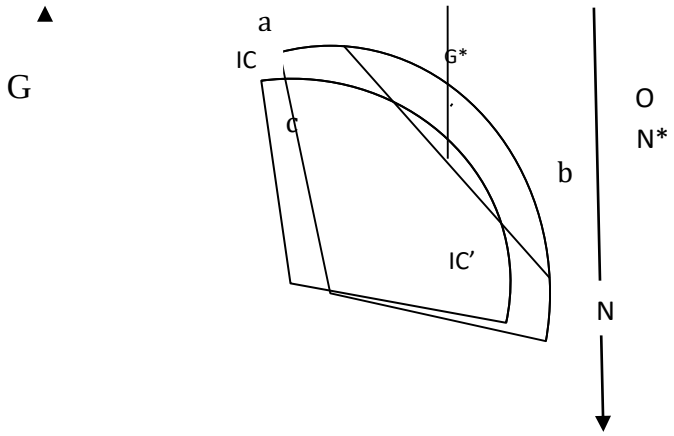


Figure 10: it shows that Consumer is better-off (having higher indifference curve (IC')) by utilizing both, private goods (N) and public goods (G) at point (c) by consuming G* amount of public goods and N* amount of private goods

Figure 10 shows the trade-off of the basket of social service (G) and the basket of private goods and services (N), in which the combination of both services gives the highest utility (c), and compares both point (a) and (b), which give lower utility. Putting it differently, unlike centering public goods or private goods (point 'a' and 'b'), the linear combination of both ensures a higher living condition with point (c) on the higher indifference curve (IC').

Equation (25) further leads to (26) and (27):

$$\alpha \frac{f}{N}\frac{\partial G}{\partial H} = -\frac{W}{W-\tau} \quad \text{.....26)}$$

$$\beta \frac{f}{N}\frac{\partial N}{\partial Z} = -\frac{W}{W-\tau} \quad \text{..... (27)}$$

Assuming that:

$$\mathbf{G=}\ H^\gamma \quad \text{.....(28)}$$

$$\mathbf{N=}\ Z^\gamma \quad (29)$$

Combining equations (26) and (27) we have:

$$\alpha \frac{f}{G}\frac{\partial G}{\partial H} = \beta \frac{f}{N}\frac{\partial N}{\partial Z} \quad \text{..... (30)}$$

Extracting common factor (f) from both sides, and use (28), and (29) we get:

$$\frac{\alpha}{h^\gamma}\ \gamma H^{\gamma-1} = \frac{\beta}{H^\gamma}\ \gamma H^{\gamma-1} \quad \text{.....(31)}$$

$$H = \frac{\alpha}{\beta}Z \quad \text{..... (32)}$$

Using (28) and (29) to substitute (G) and (N) in equation (22), we have:

$$\alpha \frac{f}{G}\frac{\partial G}{\partial H} = \alpha A\lambda^i G^{\alpha-1}\,\gamma\, H^{\gamma-1}(Z^{\gamma})^{\beta} \;\; yields \Rightarrow \;\; \alpha A\lambda^i \gamma\, H^{\gamma(\alpha-1)}\, Z^{\beta\gamma} \quad \text{.....(33)}$$

Since$H = \frac{\alpha}{\beta}Z$, therefore the equation (33) becomes:

$$\alpha \frac{f}{G}\frac{\partial G}{\partial H} = \;\alpha A\lambda^i \gamma\, (\frac{\alpha}{1-\alpha})^{\gamma(\alpha-1)}\, Z^{\gamma-1} = \frac{1}{\tau-1} \quad \text{..... (4.33')}$$

After having the interior solution of the above equation, we get the (Z) as:

$$Z = \frac{1}{\left((\alpha A\lambda^i \gamma(\frac{\alpha}{1-\alpha})^{\gamma(\alpha-1)}(\frac{1+\emptyset WL-\emptyset}{\emptyset})\right)^{\frac{1}{\gamma-1}}} \quad \text{..... (34)}$$

Substituting (34) for (Z), the equation (33) becomes:

$$H = \frac{\frac{\alpha}{\beta}}{\left((\alpha A\lambda^i \gamma(\frac{\alpha}{1-\alpha})^{\gamma(\alpha-1)}(\frac{1+\emptyset WL-\emptyset}{\emptyset})\right)^{\frac{1}{\gamma-1}}} \quad \text{..... (32')}$$

The health services provision (H) by the decentralised government is the trade-off of the central government's "cost effectiveness" factor (γ) and decentralised government's "proximity advantage factor" (γ).

Taking the first differential of above equation with respect to (λ) and (γ) we get:

Let assume that marginal utility of both, public and private goods are same (α=β). If this holds then eq. (34) and (32') are equal (H=Z).

$$\frac{\partial H}{\partial \lambda} = H\frac{-1}{\gamma-1}\frac{1}{\lambda} \quad \text{.....35)}$$

As it is been noted that ($0 \leq \lambda \leq 1$), and (λ) captures the proximity advantage of the provincial government to the local population. In case of absolute proximity becomes equal to one ($\lambda = 1$).

Equation (35) shows that how much changes take place in the provision of public health services (H) if the proximity factor (λ) changes.

The above-equation is a concave continuous function and twice differentiable ($H_\lambda > 0\; and\; H_\lambda \leq 0$).

The health services (H) is plotted on vertical axis and horizontal axis covers the proximity advantage of the local/decentralised government (λ). As(λ) increases (tends to approach one), (H) will also add up, but with decreasing rate. It is evident that marginal benefit of (λ) the provision of health services is higher at point (a) compared to point (b). Likewise,

$$\frac{\partial H}{\partial \gamma} = \frac{H}{\gamma-1}\left(ln\frac{1}{\beta A\lambda^i} - \alpha ln\frac{\alpha}{1-\alpha} - lnH - \frac{1}{\gamma}\right) \text{..... (36)}$$

The argument that we described above for (H) with respect to (λ), would also be put forward with respect to (γ). (γ) presents the technological advantage or the cost effectiveness of the federal government in the provision of the health services provision (H). The above-equation reveals the marginal changes that comes in the provision of (H) when (γ) varies. That is (H) increases with a decreasing rate when (γ) tends to approach one ($\gamma \to 1$).

Figure 10: Relations between Public Health Provision and Provincial Government Proximity Advantage

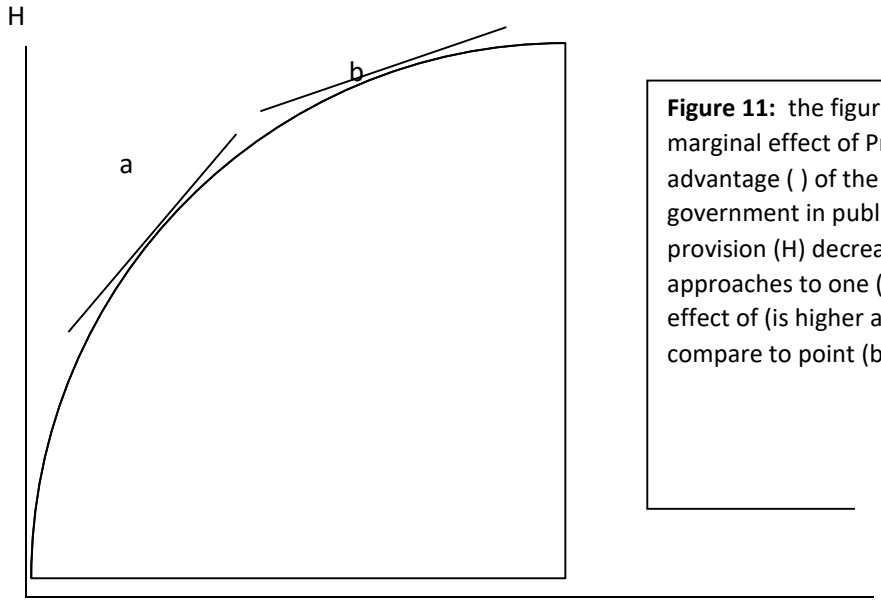


Figure 11: the figure draws on the marginal effect of Proximity advantage ( ) of the local government in public health provision (H) decreases as it is approaches to one (). Marginal effect of (is higher at point (a) compare to point (b).

5.2 Comparison of the Provision of Public Health Services (H) under Centralised and Decentralised Regimes

Since the theme of the paper is to analyse the impact of decentralisation on health, we focus only on health provision. And leave private goods (Z) for the later research to analyse so we compare both type of regimes in term of health services (H) provision with respect to the proportion tax (τ^i), which citizens have to pay in either type. Earlier we have noted that the central government (CG) has a technological advantage (γ). The relative technological advantage or cost effectiveness of (CG) in the production of public health provision lies between ($O \leq \gamma \leq 1$). When (γ) approaches (1) more competency (CG) has in the provision of public health (H).

Similarly, it has been noted earlier that since the provincial government is nearer to the local people compare to central government, it has an advantage in estimating the local need (λ), which is the "proximity factor". Furthermore, it is assumed that both types of governments levy the same type of tax, so, it may be safe to consider the (24) equal, ($\frac{\xi}{n_i}$) for both types of government.

Moreover, the above discussion reveals that the provision of public health (H) in either type of government depends on their respective advantages, that is, the "proximity advantage" (γ) of the provincial government, and "technological advantage (λ)." of the federal government. Thus, to compare the centralization and decentralisation for the provision of (H), it is plausible to compare the marginal benefit which local population extract from the (H) in term of (γ) and (λ) respectively, with the marginal cost in terms of tax rate (τ^i). Hence, based on the above-mentioned information a comparative analysis is undertaken between the types of government for the provision of health services (H). In addition to this, it would be shown that whether decentralisation or centralization is better for the efficient provision of the public health (H), or the combination of both types of governments is preferred.

Table 4: Comparison of Public Health Provision in Provincial and Fed Governments on the Basis of Equations 35 and 36 in the Model

1	Preference of Provincial Govt for the provision of public health	$\left(\frac{\frac{\partial H}{\partial \lambda}}{\frac{\partial H}{\partial \gamma}}\right) > \left(\frac{\xi}{n_i}\right)$	H^D is preferred to H^C $H^C < H^D$
2	Preference of Fed for the provision of public health	$\left(\frac{\frac{\partial h}{\partial \lambda}}{\frac{\partial H}{\partial \gamma}}\right) < \left(\frac{\xi}{n_i}\right)$	H^C is preferred to H^D $H^C > H^D$
3	Indifference between the two for the provision of public health.	$\left(\frac{\frac{\partial h}{\partial \lambda}}{\frac{\partial h}{\partial \gamma}}\right) = \left(\frac{\xi}{n_i}\right)$	h^C as preferred h^D $h^C = h^D$

5.3 Proposition

The outcomes of the centralised and decentralised types of the government in the provision of Public Health (H) may be summarised as following:

1. If the provincial government's "proximity" factor (λ), is superior to that of the federal government "technological advantage" factor (γ), then the provincial government is preferred for the provision of public health provision.
2. If federal government's "technological efficiency" factor (γ) outweighs the "proximity factor" of the provincial government, then, the federal government is preferred.
3. If the "proximity factor" (λ) offsets the "technological advantage" factor (γ) of the federal government for the provision of health services (H), then both forms of the governments are equally preferred.

5.4. Discussion on the Model

To deal with the issue of optimum provision of public health provision through either type of the government is analysed by comparing the ratios of the cost effectiveness of the centralization, and the proximity factor of the decentralisation with the costs that citizens have to bear in terms of proportional tax (τ^i). It may be prudent to assume that the marginal cost that citizens have to bear in terms of tax is fixed. Therefore, $\left(\frac{\xi}{n_i}\right)$ remains the same in the entire analysis.

As mentioned in table 8 column one, the marginal benefit of provision of health services (H) due to "proximity factor" (λ) of the provincial government is higher than the marginal benefit of "technological advantage"(γ) of the federal government$\left(\frac{\partial H}{\partial \lambda} > \frac{\partial H}{\partial \gamma}\right)$. In other words, it reveals that the "proximity advantage" of the provincial government supersedes the cost effectiveness or the "technological advantage" of the federal government in the provision of (H). That is because, given the equal burden of cost in terms of tax that citizens need to bear in either type of government, the provincial government would better target the local needs$\left(\frac{\frac{\partial H}{\partial \lambda}}{\frac{\partial H}{\partial \gamma}} > \frac{\xi}{n_i}\right)$. Thus, the citizens of a decentralised government prefer the decentralised regime for the provision of the health services. The second column of table 8 portraits an opposite result. Here the "technological benefits" of the federal government are higher than the provincial government's "proximity

advantage" factor for the provision of health services $\left(\frac{\partial H}{\partial \lambda} < \frac{\partial H}{\partial \gamma}\right)$. It is shown that the marginal benefit of the federal government with its cost-effective factor (γ) is dominated the provincial government with its proximity factor in the provision of (H) compare to the tax rate $\left(\frac{\frac{\partial H}{\partial \lambda}}{\frac{\partial H}{\partial \gamma}} < \frac{\xi}{n_i}\right)$. In such a case the citizens of the locality would considerably prefer the federal government for the provision of the health services (H). That is, if the above argument holds, the federal government is more efficient and competent to provide health services.

Finally, if provincial government proximity factor (λ) is balanced by the federal government's cost effectiveness factor (γ), then the individuals would be indifferent $\left(\frac{\frac{\partial H}{\partial \lambda}}{\frac{\partial H}{\partial \gamma}} = \frac{\xi}{n_i}\right)$. As it is shown in the last row in table 8 in which the marginal benefits from provincial government "proximity factor" is equivalent to that of federal government's "technological advantage" $\left(\frac{\partial H}{\partial \lambda} = \frac{\partial H}{\partial \gamma}\right)$. In such a situation individuals would not be concerned about which type of government provides them health services.

DATA, VARIABLES AND METHODOLOGY FOR EMPIRICAL INQUIRY

Our primary objective is to assess the effects of decentralisation to the provincial government of Balochistan on key health outcomes. We operationalize this empirically by using provincial level expenditures (and revenue) as measures of decentralisation. This makes sense, as Pakistan's intergovernmental fiscal relations create a strong association and resource sharing between central and provincial level expenditure on a range of social and economic factors including health. In terms of outcomes, we focus on three indicators; Life expectancy rate (LE), Infant Mortality Rate (IMR) and Immunization Coverage (FIC). LE is a statistical estimate of how long an organism should live depending on its birth year, present age, and other demographic characteristics such as gender. IMR is defined as Infant mortality rates are calculated as the number of deaths in the first year of life divided by the number of live births, multiplied by 1000, and "FIC" is defined as children received a Bacillus Calmette-Guerin (BCG) vaccination; three doses of the Diphtheria, Pertussis, and Tetanus (DPT) vaccine; three doses of the polio vaccine; and a measles vaccine, and should be fully immunised within the first year of life. We use LE, IMR and FIC as our preferred indicators because: i) a large development studies literature agrees that these outcome variables are important indicators of health system performance; ii) reliable data are available continuously at the provincial level for the entire period of interest for these three indicators; iii) they are calculated in ways that tend to respond more smoothly to policy changes; and iv) they are less subject to exogenous shocks, and are thus far more stable over time than the alternatives. Unlike other health indicators, they do not tend to move suddenly with changes in demand or the environment, but rather incrementally in response to policy levers. For example, measures linked to the incidence of diseases like measles, tuberculosis, or diphtheria are subject to biological shocks, leading to demand shocks that may cause indicators to swing significantly even when health policy does not. LE, IMR and FIC, by contrast, are based on a comparatively stable phenomenon. All of these characteristics allow us to link changes in these outcome variables more clearly to changes in policy than interventions against infectious diseases.

For empirical model of Robalino et al. (2002), Barankay and Lockwood (2007) and Faguet and Sánchez (2014), Faguet et al (2020), our strategy proceeds as follows in equation 6.1:

$$HS_t = \beta_0 + \beta_1 PCI_t + \beta_2 HEPC_t + \beta_3\, DPT_t + \beta_4\, DPC_t + \beta_5\, RHCS_t\, \beta_6\, PS_t + \beta_7\, ABDOC_t + \beta_8\, FD_t + \epsilon_t \qquad 6.1$$

Where outcomes HS are IMR, LE and FIC expressed as rates; PCI and HEPC are per capita income and per capita health expenditure incurred by the provincial health department, while DPT is the divisible pool transfer from the federal government to the provincial government, expressed in billions of rupees. RHCS are regional health centres in each district across the province. DPC is the population per dispensary. FD is the decentralisation dummy that equals 1 later 2009 and 0 otherwise. For simplicity we applied natural log on both sides of the equation to interpret results as elasticity.

We expect a positive (negative) relationship of healthcare outcomes and our decentralisation variables, and hence statistically significant coefficients with positive (negative) signs. Any effects of decentralisation terms are thus in addition to pure expenditure on health (both recurring and development) effect captured here.

6.1 Unit Root Test

Since, the routine of empirical procedures fails if any of the time series variables remains non-stationary level or at the first difference. To test series stationarity, the Augmented Dickey Fuller (ADF) is used. This is done through model stated as 6.2:

$$\Delta Y_t = \alpha_0 + \alpha_i Y_{t-k} + \sum_{k=1}^{n} \alpha_k \Delta Y_{t-k} + u_t \qquad \text{.....6.2}$$

The Y_t is a time series variable, Δ is used as first difference operator and u_t is a white noise error term.

6.2 ARDL Bound Test for Cointegration

The ARDL regression model stands for Autoregressive Distributed Lag regression which was popularised (Pesaran, 1997;Pesaran & Pesaran, 1997;Pesaran & Shin, 1998;Pesaran et al., 2001) after they applied in several empirical studies owing level and first order integrated time series analysis. In this study, ARDL regression model is employed because the ADF unit root test confirms- all series are the mixture of level and first difference [I (0) and I (1) order] stationary. The ARDL technique has the advantage of providing consistent estimates of the long-run coefficients that are asymptotically normal irrespective of whether the underlying regressors are (1) or I (0). Besides that, the ARDL approach is more efficient for small sample data. Pesaran and Shin (1998) show that the OLS estimators of the short-run parameters are consistent and the ARDL based estimators of the long-run coefficients are super-consistent in small sample sizes. The equation 1 is represented

$$\Delta HS_t = \theta_0 + \sum_{i=1}^{n} \theta_i \Delta HS_{t-i} + \sum_{i=1}^{n} \theta_i \Delta PCI_{t-i} + \sum_{i=1}^{n} \theta_i \Delta HEPC_{t-i} + \sum_{i=1}^{n} \theta_i DPT_{t-i} + \sum_{i=1}^{n} \theta_i \Delta RHCS_{t-i} + \sum_{i=1}^{n} \theta_i \Delta PS_{t-i} + \sum_{i=1}^{n} \theta_i \Delta ABSOC_{t-i} + \theta_i \Delta FD_t + \beta_i HS_{t-i} + \beta_i PCI_{t-i} + \beta_i HEPC_{t-i} + \beta_i DPT_{t-i} + \beta_i RHCS_{t-i} + \beta_i PS_{t-i} + \beta_i ABDOC_{t-i} + \beta_i FD_t + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (6.3)$$

Where in first part of the equation in 6.3; Δ are the Short-run the lag operators in model and $\theta_i$are the short run parameters associated with each time series variable. The coefficients β_i are associated with variables exhibits show long-run Cointegration relationship under the null hypothesis of:

H_0: $\beta_i = \beta_i = \beta_i \dots . \beta_k = 0$ (There is no long-run Co-integration)

H_1: $\beta_i \neq \beta_i \neq \beta_i \dots . \beta_k \neq 0$ (There is long-run Co-integration)

Using ARDL technique, the co-integration test is being evaluated on the basis of ARDL bound test. The bound test is based on the F-statistic test's joint significance assumption, which opposes the null hypothesis of no cointegration against the alternative hypothesis of cointegration. Pesaran et al. (2001) proposed a non-standard F statistic. When the F-statistics are smaller than the lower critical bound value (LCB), the null hypothesis of no cointegration is not rejected, but there is cointegration if the F-statistics are greater than the upper critical bound value. The co-integration test is inconclusive otherwise.

The long-run model is estimated as follows if the alternative hypothesis is accepted using the ARDL bound test approach:

$$HS_t = \theta_0 + \sum_{i=1}^{n} \beta_i HS_{t-i} + \sum_{i=1}^{n} \beta_i PCI_{t-i} + \sum_{i=1}^{n} \beta_i HEPC_{t-i} + \sum_{i=1}^{n} \beta_i DPT_{t-i} + \sum_{i=1}^{n} \beta_i RHCS_{t-i} + \sum_{i=1}^{n} \beta_i PS_{t-i} + \sum_{i=1}^{n} \beta_i ABSOC_{t-i} + \beta_i FD_t + e_t \dots\dots\dots\dots\dots 6.4$$

Furthermore, the dynamic error correction model in the short run equation of ARDL regression is used to restore the long-run information that is lost due to differencing with the estimated

lagged error correction model. As a result, the short-term ECM with a year lag is given as in equation 6.4

$$\Delta HS_t = \theta_0 + \sum_{i=1}^{n} \theta_i \Delta HS_{t-i} + \sum_{i=1}^{n} \theta_i \Delta PCI_{t-i} + \sum_{i=1}^{n} \theta_i \Delta HEPC_{t-i} + \sum_{i=1}^{n} \theta_i DPT_{t-i} + \sum_{i=1}^{n} \theta_i \Delta RHCS_{t-i} + \sum_{i=1}^{n} \theta_i \Delta PS_{t-i} + \sum_{i=1}^{n} \theta_i \Delta ABSOC_{t-i} + \theta_i \Delta FD_t + \varphi_i ECM_{t-i} + e_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 6.5$$

The coefficient $\varphi_i$associated with ECM shows the adjustment toward equilibrium. In order to have a strong co-integrating relationship the coefficient of ECM with a year lag must be negative and statistically significant.

DESCRIPTIVE STATISTICS

A large time series dataset from 1975 to 2020 has been constructed for both health and finance indicators for Balochistan. We use some of the variables to regress three empirical models, as discussed above – that are life expectancy rate, Infant Mortality Rate and Fully Immunised Children. The rest of the variables will be used for further analysis later in the project.

Table 5: Descriptive Statistics

Variables	Minimum	Maximum	Average	Standard De
Pop per Bed	1269.0	2954.0	1635.4	438.7
Per capita Income	2264.0	4319.0	3370.5	596.2
Pop in Million	3.6	13.7	7.1	2.6
Pop per Dispensary	24.7	39.2	30.2	4.1
No of Dispensary	127.0	422.0	198.2	64.2
Number of Doctors/Generalist	211.0	2081.0	930.1	472.4
Absenteeism of Doctor (%)	8.0	51.0	24.7	12.6
Availability of Medicines	800.0	36000.0	8573.8	11206.9
Paramedics staff	998.0	11186.0	5449.8	2290.5
Absenteeism of paramedics (%)	10.0	61.0	29.6	15.0
Staff Nurses	30.0	1533.0	524.7	505.5
Ministerial Staff	24.0	1503.0	493.4	495.3
Divisible Pool Transfer	0.1	302.0	47.4	80.5
Annual Outpatients at BHUs	0.0	3.8	1.1	1.3
Number of BHUs	70.0	909.0	391.5	219.0
Number of RHCs	9.0	113.0	55.9	32.0
Electrification of BHUs	6.0	434.0	142.9	125.1
Repair, Renovation and Provision of Medical Equipment at BHUs	0.8	357.0	47.4	64.5
Laboratories at BHUs	3.0	166.0	44.3	39.7
Labour Room at BHUS	12.0	134.0	49.3	32.0
Washroom/Toilets facility for patients at BHUs	5.0	455.0	96.8	119.5
Essential Drugs Procured	0.4	267.4	39.4	72.8
Per Capita health Expenditure	10.3	2322.0	420.7	640.2
Infant Mortality Rate	71.0	119.0	92.5	14.2
Life Expectancy	56.0	67.2	62.2	3.2
Fully Immunised Children	1.0	62.0	36.7	19.6
Proportion of Pregnant Women with pre-natal care	2.0	43.0	17.7	13.1
Crude Death Rate	8.0	15.0	10.3	1.9
Total funds allocated to health sector (Recurring)	51.6	31405.4	4035.2	7520.8
Health Development Expenditure (in Million)	10.3	7094.1	875.6	1664.3
Provincial Budget (in Billion)	0.3	465.5	79.4	121.9
Decentralisation (Revenue)	0.01	0.02	0.02	0.00
Decentralisation (Expenditure)	0.01	0.15	0.06	0.03
Decentralisation (Local)	0.04	0.58	0.23	0.12

The descriptive statistics of all variables based on various data sources (Sources are discussed above) are reported in table 10. The value of overall expenditure decentralisation for Balochistan ranges from 0.01 to 0.15, which illustrates a significant improvement in terms of expenditure decentralisation in Balochistan. As far as the revenue decentralisation is concerned Balochistan

lags far behind, as at maximum its share to total national revenue was just 0.02%. Another important variable is local decentralisation, which is expenditure decentralisation to third tier (local governments) from the second tier (provincial government. It is interesting to note that there is large dispersion of local decentralisation – it ranges from 0.04 to 0.58, as noted in table 10. Our three dependent variables, "immunisation drive", "infant mortality rate (IMR) and proportion of pregnant women with pre-natal care" (WWPC) also show much dispersion. For example, the highest value of WWPC is 43%, whereas its lowest value is 2. However, the highest variation is reported in immunised children – maximum value of 62, while its minimum is just 1. Another important variable to report is divisible pool transfer, which was as low as 1 billion rupees and rose to 302 billion, which shows better fiscal space made available for the province over the time.

SOME PRELIMINARY EMPIRICAL RESULTS AND DISCUSSIONS

8.1 Unit Root Test (ADF)

In order to perform time series analysis, the Augmented Dickey-Fuller (ADF) test is used to test series stationarity. The statistical results are reported in table 11. The ADF test statistics confirm the presence of unit root in many variables. For example, the t-statistics corresponding to the P-value of LE, IMR, PCI, PCHE, DPT, DOC, ABDOC, and DPC were found to be statistically insignificant. It shows that the test statistics failed to reject the null hypothesis that the series has a unit root on the basis of t-statistics at a 1, 5, and 10% level of significance. It demonstrates that the majority of health indicators, as well as their socioeconomic determinants, are non-stationary at the national level. On the other hand, the t-statistics corresponding to their P-value for FIC, RHCS, and PS were found to be statistically significant. This demonstrates that these variables are statistically significant and indicate the level of stationarity. These series have unit root because the ADF test statistics failed to accept the null hypothesis at the 1, 5, and 10% levels of significance. All the variables are found to be stationary at first difference, but none of them are second difference stationary. To conclude ADF test statistics, all variables were found to have a mixture of integration I (0) and I (1) but none of them was I (2). Therefore, employing ordinary least squares (OLS) for long-run association is questionable. In this regard, Pesaran et al. (2001) developed the Autoregressive Distributed Lags (ARDL) unbiased estimate approach for mixtures of integrated series. Based on statistical results (ADF Unit root), it is confirmed that all series are the mixture of integration I (0) and integration I (1), satisfying the prerequisite conditions of the ARDL model.

Table 6: ADF Unit Root Test

Variables	**Level**		**First difference**	
	t-Statistic	P-Value	t-Statistic	P-Value
LE	-1.818	0.367	-6.927	0.000
IMR	-1.108	0.704	-1.957	0.049
FIC	-3.200	0.027	-6.063	0.000
PCI	-0.993	0.748	-5.637	0.000
PCHE	0.005	0.954	-5.386	0.000
DPT	-0.479	0.886	-6.743	0.000
DPT	-0.479	0.886	-6.743	0.000
RHCS	-2.812	0.065	-7.994	0.000
DOC	-2.075	0.255	-5.465	0.000
ABDOC	-1.197	0.667	-8.231	0.000
DPC	-1.357	0.594	-6.122	0.000

Author estimates: Note all variables are transformed to natural log.

8.2 Diagnostics Test

Prior to estimating long-run and short-run relationships between health indicators and fiscal indicators, it is important to satisfy basic regression assumptions such as no autocorrelation, heteroscedasticity, residual normality, and the unbiased functional forms. The prerequisite of diagnostic tests statistics are reported in table 12. The results satisfy the essential assumptions of no-autocorrelation in all three equations. The F-statistics corresponding to its P-value are found to be statistically insignificant at a 5% level of significance using the L-M test, allowing us to accept the null hypothesis that there is no autocorrelation in equations 1 to 3. On the other hand, the BPG test is used to test the homoscedasticity of all respective models. The test statistics of each equation are found to be statistically insignificant, which does not allow us to reject the null hypothesis of homoscedasticity at a 5 percent level of significance. Furthermore, the

functional form of each equation is tested through the Ramsey RESET test. At a 5% level of significance, the test statistics confirm the correct order of each equation and the unbiased specification. The Jarque-Bera test is used to test residual normality, and the test statistics assure us that residuals are normally distributed in our proposed equations.

Table 7: Diagnostic Test

Diagnostic Test	**Model 1: IMR**		**Model 2: LE**		**Model 3: FIC**	
Serial Correlation Test	F-stats	Prob	F-stats	Prob	F-stats	Prob
LM Test	3.611	0.059	1.365	0.271	0.888	0.422
Heteroscedasticity Test						
BPG test	1.036	0.489	1.012	0.462	0.971	0.496
Ramsey RESET Test	0.463	0.507	0.438	0.513	1.193	0.283
Jarque Bera Test	1.156	0.561	0.860	0.651	2.807	0.246

Author estimates.

8.3 ARDL Bound Test

The economic theory, particularly that two or more variables may fluctuate and converge around a long-run equilibrium position, one might not have a long-run association and such movement may be natural or due to other variability in macroeconomic factors which leads to the issue of "spurious regression". In econometrics, the co-integration approach is widely employed to examine a long-run equilibrium association between dependent and independent variables to avoid such issues as "spurious regression". After satisfying all the required tests for time series analysis, it is also empirically proved that the ARDL regression model is a more suitable technique to investigate the relationship between health outcomes and socioeconomic and fiscal indicators in Balochistan. Moreover, before the long run and short run association, the existence of co-integration was primarily a step-in time series analysis. The Pesaran et al. (2001) bound testing approach is used to test cointegration between the health services and their determinants. The null hypothesis of "no long-term association" against the alternative hypothesis of the existence of a long-term association is being evaluated on the basis of calculated F-statistics for all respective models of health outcomes.

Table 13 summarises the outcomes based on the ARDL bound test for the following three tentative models of health outcomes: Our estimated F-statistics failed to accept the null hypothesis of "no-long run relationship" at a 5 percent level of significance and allowed us to accept the alternative hypothesis that there is a long run relationship between the health outcomes such as IMR, LE, and FIC and their corresponding determinants. Because the calculated F-statistics for each model were found to be higher than their corresponding critical lower and upper bounds at the 5% level of significance. Therefore, the study concludes that each equation in the study does not contain the issues of “spurious regression”.

Table 8: ARDL Bound Test Statistics

ARDL Bound Test Statistics						
Health indicators	Model 1: IMR		Model 2: LE		Model 3: FIC	
Significance Level	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
10%	2.53	3.59	2.53	3.59	1.83	2.94
5%	2.87	4	2.87	4	2.06	3.24
2.50%	3.19	4.38	3.19	4.38	2.28	3.5
1%	3.6	4.9	3.6	4.9	2.54	3.86
Calculated F-Statistics	4.88		10.27		7.74	

Author estimates.

8.4 ARDL Regression Model

In this section, we discuss some of the preliminary empirical results obtained through the ARDL regression model based on the first research question and hypothesis. It is important to mention that these are preliminary results of our study, and we are still working to refine the results and make them more plausible. Given the time series specification and nature of the available dataset, we applied the ARDL regression technique to regress all three health outcome variables on decentralisation and a range of other control variables from 1975 to 2020. As we discussed earlier in the paper, the 7th NFC Award and the 18th Amendment in 2009 and 2010 respectively, were the turning points towards decentralisation in which Balochistan gained not only a bigger fiscal space but also more autonomy in a whole range of subjects, including health. Since the theme of the paper is to assess whether decentralisation has been effective (or otherwise) in improving (or otherwise) the coverage and quality of health services, we introduced a dummy variable of fiscal decentralisation that seems to be imperative.

Infant Mortality Rate and Decentralisation

The ARDL regression-based output is shown in Tables 14, 15 and 16, and the statistical significance is determined using t-statistics, which correspond to the P-value at a 5% level of significance. The reported results are followed by a rigorous analytical discussion. The preliminary results indicate that per capita income, regional health centres and paramedic staff have a significant and favourable impact on the infant mortality rate in Balochistan. However, the fiscal decentralisation, divisible pool transfer, and percentage absence of doctors were found to be unfavourable in relation to the infant mortality rate in Balochistan. The long-run slope coefficients of PCI, RHCs, and PS were found to be statistically significant and negative. It suggests that a 1% increase in PCI, RHCs, and PS results in a -0.848, -0.764, and -0.387% decrease in IMR, respectively. The long-run slope coefficients of FD, DPT, and ABDOC are found to be positive as well as statistically significant. It suggests that due to decentralisation, IMR on average increases by 0.106 each year. Moreover, it also indicates that a one percent increase in DPT and ABDOC leads to an increase in IMR by 0.180 and 0.255 percent in the long run. Interestingly, the impact of health expenditure per capita (PCHE) was found to be theoretically consistent (negative) but statistically insignificant. This demonstrates that decentralisation is not playing any beneficial role in reducing IMR in Balochistan.

To examine the dynamic of IMR and its determinants, we discussed the short-run relationship reported in table 13. The results indicate a consistent behaviour of individual factors as long run coefficients except for PCI over time lags. For example, the slope coefficient of lag IMR shows that IMR is dependent on its second-year lag period. A one percent increase in IMR (-2) raises the current IMR by 0.478 percent on average. The short-run impact of per capita income shows that, on average, a one percent increase in PCI in a lag period increases current IMR by 0.16 percent. Furthermore, a 0.06 percent increase in the percentage of divisible pool transfer (DPT) increased

the IMR rate in the short run. On the other hand, the regional health centre (RHCS) and paramedic staff (PS) play a major role in reducing IMR in the short run. Our findings indicate that a 1% increase in RHCS and PS results in a 0.18 and 0.26 percent reduction in IMR in the short run, respectively. Such effects may differ with time lags. Whereas the issue of absenteeism of doctors in Balochistan leads to an increase in IMR of 0.027 percent. The dummy of fiscal decentralisation indicates that, in the short run, the impact is the same as in the long run. According to the slope coefficient, decentralisation causes 0.04 percent of IMR to rise in the short run. Lastly, the coefficient of ECM (-1) is found to be negative as well as significant. This indicates that if any disequilibrium is caused in the short run, the equilibrium level of IMR will move toward equilibrium position at about 0.379 speed in the immediate year.

Life Expectancy Rate and Decentralisation

Health outcomes in terms of life expectancy (LE) along with corresponding determinants are examined in table 15. The empirical findings show that health expenditure per capita (PCHE), regional health centres (RHCS), and Divisible Pool Transfer (DPT) are positively and significantly associated with life expectancy rate in Balochistan, whereas percentage of doctors (ABDOC), paramedics staff (PS), and Divisible Pool Transfer (DPT) are negatively and significantly associated with life expectancy rate. Subsequently, per capita income (PCI) and fiscal decentralisation (FD) were found to have a negative but statistically insignificant impact on the life expectancy rate in the long run. Although, in the short run, the impact of PCI, PCHE, and FD was also found to be statistically insignificant. Additionally, the short-run findings indicate that a percentage increase in DPT and RHCS leads to an increase in LE of 0.013 and 0.027 percent. Whereas a 1% increase in PS results in a 0.3% decrease in LE. The coefficient of ECM (-1) is negative as well as significant. The disequilibrium in the LE equation corrects toward equilibrium position at about 78% speed in the immediate year. This demonstrates a strong co-integrating relationship between LE and independent variables. Concluding equation 2, it is revealed that fiscal transfer through a divisible pool is a major issue in reducing life expectancy rate after absenteeism of doctors and existing paramedic staff. Unlike equation 1, equation 2 suggests that fiscal decentralisation statistically does not contribute to an improvement in the life expectancy rate for the people of Balochistan.

Children Immunisation Rate and Decentralisation

Children with full immunity (FIC) are also coupled with IMR and LE as major health outcomes. Therefore, the FIC is examined along with corresponding determinants and is reported in table 16. It is noteworthy that adjusting for omitted variable biases by including a ray of control variables such as per capita income (PCI), percentage of doctors (DOC), and paramedic staff (PS), does not seem to change the statistical relationship between decentralisation and health outcomes. The slope coefficient of these variables was found to be positive but statistically insignificant.

The first control variables of interest in terms of decentralisation are the transfer of resources from the federal government to Balochistan through the NFC Award, which we show as *divisible pool transfer (DPT)*. Like the expenditure decentralisation variable, the DPT to Balochistan has increased substantially over time. However, similar to decentralisation, the divisible pool transfer variable appears to be *insignificant* in the long run with fully immunised children **(**FIC) in Balochistan. Another important control variable worth reporting is the per capita income, which appears to be insignificant at 1, 5, and 10% levels of significance. Although the health income per capita (PCHE), regional health care centres (RHCS), and dispensary per capita (DPC) were found to be positive and highly elastic in relation to FIC in the long run, The slope coefficient suggests that a one percent increase in PCHE, RHCS, and DPC leads to an increased FIC rate of 1.62, 3.49, and 2.36 percent. Whereas the variable of interest, FD, was found to be negative but statistically

insignificant. This demonstrates that decentralisation does not have a favourable impact on FIC in the long run.

Additionally, the elasticity of the FIC rate with respect to PCHE and RHCS was found to be unitary elastic in the short run. In contrast to its long-term impact, DPT has a positive and significant impact on the FIC rate in Balochistan in the short run. The statistical evidence shows that a one percent increase in DPT leads to an increase in the FIC rate of 0.452 percent. But the dummy of fiscal decentralisation was found to be negative as well as insignificant. Moreover, the statistical evidence also shows that the DPC has a negative and significant impact on the FIC rate. This demonstrates that in the short run, an increase in per capita dispensaries does not contribute to the FIC rate, indicating the inefficiency of dispensaries in Balochistan. Lastly, the coefficient of ECM (-1) demonstrates a strong co-integrating relationship between FIC and independent variables. If there is any disequilibrium in FIC, it will be resolved at a rate of 63.8 percent in the next year.

Table 9: Regression Model; IMR

Dependent Variable: IMR				
Selected Model: ARDL (3, 1, 0, 1, 3, 2, 1)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
PCI	-0.848	0.263	-3.225	0.006
PCHE	-0.092	0.113	-0.813	0.430
DPT	0.180	0.089	2.026	0.062
RHCS	-0.764	0.223	-3.427	0.004
ABDOC	0.255	0.044	5.764	0.000
PS	-0.387	0.150	2.579	0.022
FD	0.106	0.047	2.270	0.040
C	10.224	2.944	3.473	0.004
@TREND	0.018	0.012	1.487	0.159
Short Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IMR(-1))	0.049	0.204	0.242	0.812
D(IMR(-2))	0.478	0.225	2.125	0.052
D(PCI)	0.045	0.057	0.788	0.444
D(PCI(-1))	0.161	0.065	2.483	0.026
D(PCHE)	-0.035	0.034	-1.040	0.316
D(DPT)	0.062	0.013	4.657	0.000
D(DPT(-1))	-0.001	0.014	-0.096	0.925
D(RHCS)	-0.181	0.047	-3.824	0.002
D(RHCS(-1))	-0.047	0.042	-1.107	0.287
D(ABDOC)	-0.021	0.016	-1.288	0.219
D(ABDOC(-1))	-0.003	0.012	-0.275	0.787
D(ABDOC(-2))	0.021	0.010	2.152	0.049
D(PS)	0.004	0.071	0.055	0.957
D(PS(-1))	-0.261	0.104	-2.520	0.025
D(FD)	0.040	0.015	2.744	0.016
D(@TREND())	0.007	0.003	2.156	0.049
ECM(-1)	-0.379	0.153	-2.475	0.027

Author estimates; Note all variables are log transformed.

Table 10: Regression Model; LE

Dependent Variable LE				
Selected Model: ARDL (1, 0, 1, 1, 0, 1, 1)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
PCI	-0.017	0.019	-0.872	0.390
PCHE	0.023	0.009	2.513	0.018
DPT	-0.012	0.006	-2.179	0.037
RHCS	0.035	0.013	2.636	0.013
ABDOC	-0.014	0.005	-3.077	0.004
PS	-0.058	0.019	-3.003	0.005
FD	-0.005	0.006	-0.927	0.361
C	4.588	0.252	18.231	0.000
@TREND	0.004	0.001	4.946	0.000
Short Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PCI)	-0.013	0.015	-0.890	0.381
D(PCHE)	0.007	0.010	0.712	0.482
D(DPT)	0.013	0.004	2.943	0.006
D(RHCS)	0.027	0.010	2.803	0.009
D(ABDOC)	-0.001	0.003	-0.185	0.854
D(PS)	-0.030	0.012	-2.460	0.020
D(FD)	-0.004	0.005	-0.911	0.370
D(@TREND())	0.003	0.001	4.121	0.000
ECM(-1)	-0.780	0.104	-7.469	0.000

Author estimates; Note all variables are log transformed.

Table 11: Regression Model; FIC

Dependent Variable FIC				
Selected Model: ARDL (1, 0, 0, 1, 1, 0, 0, 0)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
PCI	0.649	0.953	0.681	0.501
PCHE	1.623	0.418	3.881	0.001
DPT	0.043	0.287	0.149	0.883
RHCS	3.495	1.010	3.461	0.002
DOC	0.189	0.708	0.266	0.792
PS	0.644	1.078	0.598	0.554
DPC	2.363	1.018	2.320	0.027
FD	-0.329	0.338	-0.975	0.337
C	-15.109	11.090	-1.362	0.183
@TREND	-0.343	0.048	-7.155	0.000
Short Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PCI)	0.414	0.620	0.669	0.509
D(PCHE)	1.036	0.329	3.148	0.004
D(DPT)	0.452	0.195	2.310	0.028
D(RHCS)	1.428	0.641	2.229	0.033
D(DOC)	0.120	0.465	0.259	0.798
D(PS)	0.411	0.687	0.599	0.554
D(DPC)	-1.508	0.792	-1.902	0.066
D(FD)	-0.210	0.220	-0.954	0.347
D(@TREND())	-0.219	0.063	-3.496	0.001
ECM(-1)	-0.638	0.181	-3.518	0.001

Author estimates; Note all variables are log transformed.

SOME CONCLUDING REMARKS

It is difficult to overstate the difficulty of doing provincial empirical work on Pakistan in general and particularly to its less developed province Balochistan. Creating the database required for this paper, and also now useful for any such study, required months of hard work and a huge amount of improvisation on the part of us. The resulting database no doubt contains errors and omissions that could be improved upon by future researchers working in this field. Such data refinements and extensions might not only improve confidence in statistical estimations, but also permit further, more nuanced questions to be answered. This is one contribution of the paper; we hope the dataset will become a useful tool for researchers and students in Pakistan and beyond.

We build a simple model to compare the role of central and decentralised governments in health services provision. Our simple yet compelling model suggests that decentralised government, given its proximity and accountability factor, may be more suitable for providing health services. The federal government on the other hand may be more efficient given its better governance and institutional structure in health services provision.

Our results imply that decentralisation is *not improving* performance in Baluchistan's public health sector, specifically by increasing provision of health services for decreasing infant mortality rate, increasing life expectancy rate and increasing coverage of fully immunised children. Evidence for this comes from provincial-level time series regressions – the paucity of data does not allow us to conduct district level analysis with a panel approach.

Using data from 1975 to 2020 to examine the effect of decentralisation, the study found health outcomes improve as total resource expenditures increase, as one would expect. The magnitudes are significant for regression results based on the available dataset. In contrast to existing literature, our empirical findings reveal that decentralisation does not significantly contribute to health outcomes when it comes to infant mortality rates in Balochistan. However, a negative but insignificant relationship was observed between decentralisation and life expectancy rate and immunisation rate in Balochistan. The main reason for this ineffectiveness appears to be weak institutional, related to a plethora of local factors. These might be supply-side, such as greater inefficiency in public management, or lack of better-informed decisions; demand-side, such as due to a lack of awareness of less citizen demand for health services; or both, such as a lack of accountability of officials to citizens. An unbiased analysis is required to disentangle these effects and determine which predominates. But what cannot be doubted is that Balochistan has not made good progress in health service provision despite decentralisation initiatives and better health budgeting. Subsequently, per capita health expenditure, per capita dispensaries, regional healthcare centres, and divisible pool transfer were found to be the most important factors for children's immunisation rates in Balochistan. More specifically, the divisible pool transfer has significant and unfavourable impact on infant mortality rate and life expectancy rate however, positive but insignificant impact on children's immunisation rate. However, regional health care centres, health and expenditure increase whereas the absence of doctors reduces the life expectancy rate in Balochistan.

What does the evidence of this paper add to our broader understanding of decentralisation? First, a case study of decentralisation in a large, important province of a federation, which used to complain for greater autonomy and more decentralisation from the federation, these may be applicable not just for Balochistan but in the developing world more broadly. Second, we present a theoretical model to show that unless fully equipped with all institutional and administrative capacity, decentralised setup may not be effective in increasing public health services provision after a certain threshold. Third, empirical results that are clear and robust provide a solid ground to engage for more qualitative work towards this. For years, studies of decentralisation have commenced by bemoaning the mixed and inconclusive results of the decentralisation literature. As our introduction implies, the time has come to put that view behind us. The bedrock of indeterminacy lies in a raft of studies from the 1960s-1980s that relied on mainly qualitative

evidence, and compared countries that had sometimes implemented very different types of reforms.

The availability in recent decades of much higher-quality, more fine-grained data has made possible a newer generation of decentralisation studies that use large-N approaches within even a subnational to probe the effects of decentralisation deeply and robustly. As Channa and Faguet (2016) show, the results of such studies are much less ambiguous. In focused studies of countries that really reformed, for example Argentina, Switzerland, Bolivia, the UK, Brazil, Colombia, and now Pakistan, decentralisation's impact on the provision of primary services can be studied. Pakistan is notable in this list not only for its big size and diversity, but also as a low-income country with relatively low state capacity, especially when it comes to subnational level, as we see in the case of Balochistan.

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APPENDIX

Table 12: Variables, Variables Codes and Measurement/Definition of Variables

	Variables	**Code**	**Measurement/Definition**
1	Pop per Bed	PPB	Hospitals beds available per 1000 people in public hospitals and dispensaries
2	Per capita Income	PC	Per capita income is gross regional (Balochistan) product divided by midyear population, at Constant Factor Cost of 1980-81.
3	Pop in Million	Pop	Midyear population (in Million people)
4	Pop per Dispensary	PPD	Population per dispensary
5	No of Dispensary	NDP	Total dispensaries in the province in each year
6	Number of Doctors/Generalist	NDC	Total number of doctors
7	Absenteeism of Doctor (%)	ABDC	Absenteeism expressed in percentage
8	Availability of Medicines	AM	Amount given to each BHUs for availability of Medicines. Expressed in thousands of rupees
9	Paramedics staff	PS	Aggregated Paramedics in all districts each year
10	Absenteeism of paramedics (%)	AP	Absenteeism expressed in percentage
11	Staff Nurses	SN	Total registered Nurses
12	Ministerial Staff	MS	Total Supporting Staff at BHUs and RHCs and Civil Hospitals
13	Divisible Pool Transfer	DPT	Share of Balochistan in divisible pool as per NFC formula. Expressed in Billion
14	Annual Outpatients at BHUs	AOPB	Total annual number of Outpatients visited BHUs
15	Number of BHUs	NBHUs	Total numbers of Basic Health Units officially operating in all districts
16	Number of RHCs	NRHCs	Total numbers of Regional health Centres officially operating in all districts
17	Electrification of BHUs	EBHUs	Numbers of BHUs supply with regular electricity
18	Repair, Renovation and Provision of Medical Equipment at BHUs	RMP	Annual grants provided for Repair, Renovation and Provision of Medical Equipment at BHUs. Expressed in thousands rupees
19	Laboratories at BHUs	LBHUs	Total Number of Laboratories in BHUs
20	Labour Room at BHUS	LRBHUs	Total Number of labour rooms in BHUs
21	Washroom/Toilets facility for patients at BHUs	WTBUHUS	
22	Essential Drugs Procured	EDP	Amount of Drugs procured for each BHUs, RHCs and Civil Hospital. Expressed in Million rupees
23	Per Capita health Expenditure	PCHE	Total health expenditure by provincial government divided by total provincial population
24	Infant Mortality Rate	IMR	Total infants who die before reaching to the age of five out of thousand per year
25	Life Expectancy	LE	The number of years a new-born baby would before its death.
26	Fully Immunised Children	IC	Children received a Bacillus Calmette-Guerin (BCG) vaccination; three doses of the Diphtheria, Pertussis, and Tetanus (DPT) vaccine; three doses of the polio vaccine; and a measles vaccine, and should be fully immunised within the first year of life.
27	Proportion of Pregnant Women with pre-natal care or antenatal care coverage rate	WWPC/ANC	The antenatal care coverage rate (or ANC coverage rate) is calculated as the total number of pregnant women attended at least once during their

	Variables	Code	Measurement/Definition
			pregnancy by a health professional for reasons relating to the pregnancy, divided by the total number of expected pregnancies during a given time period (usually one year) in the catchment area. The result is expressed as a percentage by multiplying by 100.
28	Crude Death Rate	CDR	Total number of people of society who die out of one thousand per year
29	Total funds allocated to health sector Recurring	CTF	Annual funds allocated to Health sector for recurring expenses in Billion Rupees
30	Health Development Expenditure	HDE	Annual funds allocated to Health sector for development in Billion Rupees
31	Revenue Decentralisation	DecentR	The ratio of provincial government' expenditures to total national (federal + provincial governments) expenditures.
32	Expenditure Decentralisation	DecentE	The ratio of provincial government' expenditures to total national (federal + provincial governments) expenditures.
33	Local Decentralisation	DecentL	The ratio of district governments' expenditures to total national (provincial + district governments) expenditures.
34	Devolution Plan Dummy	Dev D	A dummy is included to capture the impact of the 18th Amendment. It takes 1 from 2010 onward and zero (0) otherwise.
35	Dummy Variable	DM09	A dummy is included to assess the impact of variables pre decentralisation It takes 1 from 1975 to 2009, and zero (0) afterward
36	Dummy Variable	DM10	A dummy is included to assess the impact of variables post decentralisation It takes 1 from 2009 onward, and zero (0) otherwise.