

HEALTH EXPENDITURE, HEALTH OUTCOMES AND THE ROLE OF DECENTRALISED GOVERNANCE: EVIDENCES FROM RURAL INDIA

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Political scientists and health policy makers argued that outcomes of the health sector can be improved by improving the service delivery system through decentralisation in governance. But evidences on what constitutes decentralisation, how it affects health outcomes and efficacy of allocated public funds in health are lacking. This paper examines the impact of different decentralised governance measures on infant and child mortality rates of rural India across states and in improving the efficacy of rural health spending. The results show that public health spending in rural area is significant in securing better health outcomes of rural India. The efficacy of rural health spending moreover increases with the extent of decentralised governance in a state. It is noticed that states with high fiscal and political decentralisation have more significant impact in reducing the infant mortality compared to states having high fiscal but low political decentralisation, indicating efficacy of fiscal decentralisation increases with political decentralisation. The study recommend that along with allocating more public funds in rural health sector, the adequate devolution of fiscal, functions, functionaries/administrative and political powers to local bodies can be a significant step towards improving the outcomes of health sector of rural area.

Keywords: Decentralisation, Governance, health outcomes, political participation, public funds for health

1. INTRODUCTION

Globally, it is argued that public spending on health can have positive impact on health outcomes [Farahani, et al., 2010, Pp. 1361-76] particularly in the poor regions, but it cannot be the dominant driver; the factors, namely, income, income inequality, poverty, female education are the other major determinants of health status of the population [Filmer and Pritchett, 1999, Pp. 1309-23]. In addition, countries with good governance level secured better health outcome [Kaufmann et al., 2004] even with low/same level of spending [Farag, et.al, 2013, Pp. 33-52]. The impact of increase in government health expenditure on MDGs outcome was found to be non-/minimal in countries with low governance level

[Wagstaff and Claeson, 2004]. The impact (size of coefficient) of increase in government spending on health thus depends on the level of good governance achieved by the country [Rajkumar and Swaroop, 2008, Pp. 96-111; Farag et.al, 2013]. Thus, governance has become central in determining the efficacy of public spending for better health outcomes.

The governance, however, is a wider term and, therefore, measured differently, namely, through country policy and institutional assessment, accountability, corruption and decentralisation indices, etc. The decentralised governance (an effective form of good governance) has been advocated as a powerful tool to improve services

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delivery. This involves devolution of powers and authorities to local governments. Scholars have argued that decentralised mechanism improves accountability, effectiveness, efficiency of service delivery [Litvack et al., 1998] by bringing decision makers closer to the people and by enhancing the participation of the community in the decision making and implementation process. Their close relation with the local people enables them to know the local problems and needs, and they are therefore in a better position to establish the right priorities than a central or regional government far away [Peabody et al., 1999]. Local governments have more and better information regarding their constituents, and they may be better able to enforce and coordinate policies and programmes at local level [Oates, 1994; Prud'home, 1995]. Being at a close proximity of those in charge also enables citizens to better monitor the responsible parties' performance and hold them accountable.

Health reformists argue that decentralisation can enhance the participation of local communities in decisions regarding health policy objectives, goals, strategies, planning, financing, implementation and monitoring, which are important to improve the health outcomes [Lieberman, 2002]. It also promotes inter-sectoral coordination, increases accountability, reduces duplication, and improves the implementation of health programmes. This, in turn, affects the quality and coverage of health services delivery and thereby health outcomes. For instance, the empirical studies have highlighted that impact of decentralisation has been found significant in reducing the mortality rates in many countries [Robalino et al., 2001] in varied degrees. The marginal benefit from decentralisation is found to be greater in some low and middle income countries like India [Mahal et al., 2000; Asfaw et al., 2004; Khaleghian, 2003; Ebel and Yilmaz, 2002], Argentinean provinces [Habibi et al.,

2001] and China [Yee, 2001] and none or negative impact in some others [Treisman, 2000, Pp. 399-458; Montoya and Vaughan, 1990, Pp. 55-63]. It is argued that the impact of decentralisation in broader sense depends on properly designed/ measured [Ebel and Yilmaz, 2002] and implemented decentralised policy, in the absence of which, it may pose risks and challenges that may lead to a deterioration in the provision of health services and consequently to poor health outcomes [Lieberman, 2002].

The studies that have examined the impact of decentralisation on health outcomes either relied on political [Mahal et al., 2000], or fiscal decentralisation at Panchayat [Asfaw et al., 2004] and state level [Robalino et al., 2001] or both [Yee, 2001]. The decentralisation measures that have been used in Indian context seem to be weak in measurement¹ which generally cover limited dimensions of decentralisation.² We believe that the gamut of issues that involve comprehensive dimensions of the devolution of different powers (like, fiscal, functional, administrative and political powers) to local bodies have not been captured. In order to fully evaluate the gains from decentralisation, the conceptual clarity on what constitutes decentralisation, how it can be empirically captured and what the constituent elements are needs to be incorporated in a measure of decentralisation. It also needs to be pointed out here that the measurement of decentralisation is highly context specific [North, 1997]. The manner, instruments and mechanisms through which decentralisation gets grounded in any region or country has to be kept in mind in order to identify the parameters that can be used to capture the spatial and regional variations in the quantum of decentralisation.

Along with this theoretical understanding, the literature on the subject that has highlighted that the impacts of decentralisation are highly sensitive to the way the decentralisation variables are measured [Ebel and Yilmaz, 2002], motivated us

to construct an appropriate measure of decentralisation in health of a particular country (India), across its provinces/states that are governed under one constitutional provision. Considering this fact in advance, this study provides a conceptual framework and methodology for some robust measures of the extent of decentralisation across major states of India and compares how these states have performed to achieve a desired level of decentralisation. The estimated dimensions of decentralisation are then associated with selected health outcome parameters of these states. The study specifically includes the important indicators on functional, financial, functionaries/administrative responsibilities/authorities of local Panchayat that are devolved to them under the 73rd Constitutional Amendment Act (CAA).

Based on the decentralisation initiatives that have been taken by Indian government (specially under 73rd CAA), this study first isolates the core dimensions, relevant to the Indian context, to capture the comprehensive measure of decentralisation and then converts these dimensions into measurable parameters along with elaboration of a methodology to combine these parameters. Finally, their impacts on two important Millennium Development Goals of health outcomes, namely, infant mortality rates (IMR) and under five mortality rates (U5MR),³ by considering a case of rural India at the level of 16 major states are examined. The decentralisation measurements further are used to evaluate the effectiveness of health spending in improving the health outcomes in low and high decentralisation setting. Examining the effectiveness of decentralisation in Indian context became particularly important in view of the fact that Indian government has committed to spend a high 2-3 percent of GDP in health sector under a highly decentralised policy framework [NRHM, 2005]. The belief is that a higher amount of public spending will not contribute substantially, if the existing facilities or funds are not provided and managed through proper channel or through

effective government interventions, community participation or through decentralised governance. How far and how effectively this approach has been working needs to be examined.

2. MEASURING DECENTRALISATION

In order to fully evaluate the gains from decentralisation, this section discusses what constitutes decentralisation, what its constituent elements are and how it can be empirically captured. These elements are worked out from a detailed study on the decentralisation initiatives that have been taken by Indian Government. For instance, India has been placing the strength of decentralisation in its development policy agendas since the time of independence; the direct democracy, however, was strongly mandated in the early 1990s through 73rd and 74th Constitution Amendment Acts (CAA). These Acts have enabled state legislatures to transfer, if they so choose, adequate powers and responsibilities to local bodies to enable them to prepare and implement schemes for economic development and social justice. The 73rd Constitution Amendment Act provided viable way of transferring political,⁴ fiscal and administrative powers to rural local bodies. This also made a provision of some mandated actions, like constitution of State Election Commission (SEC),⁵ State Finance Commission (SFC),⁶ District Planning Committee (DPC)⁷ and Gram Sabha⁸ to ensure an effective way and process of decentralisation in India. The responsibility on 29 functions,⁹ under the Eleventh Schedule, is also sought to be entrusted to local Panchayat in planning and implementation of works of local significance. This Act, in a way, provides a formal instrument of *minimum* level of rural decentralised governance in India by enabling state legislative bodies to transfer, if they so desire, functional, financial and functionaries (administrative) powers to local governments along with delegation of political powers to ensure participation of people in grass root politics and policy. Giving discretionary powers to

the states to devolve power to PRIs can greatly dilute the decentralisation process in a state as state(s) may not devolve important functions to the PRIs and so the functionaries and funds also do not get correspondingly devolved to them. Therefore, the extent of devolution of personnel control (functionary), funds and functions powers may vary across states which will impact the magnitude of decentralisation process in that particular state and in turn affect outcomes of the health sector. The extent of decentralisation would be high in states that have devolved adequate and balanced 3Fs powers to PRIs; in reverse case, it would be low. The state that devolves inadequate powers and authorities to local governments in effect treats its local bodies as agents of the state government and no participatory approach is followed. This does not only lower the extent of decentralisation in governance in the state but also reduces local participation in grass route plans and policies in a sector like health. Therefore, devolution of decentralisation powers to local bodies became important for improving the health outcomes.

To capture the diversity in devolution of powers, the study has constructed a comprehensive measure of decentralisation at the state level using information on 18 indicators of funds, functions, functionaries (3Fs) powers which have been devolved to local Panchayat under 73rd CAA on matters and activities related to health (Appendix A). This index not only captures the extent of fiscal decentralisation (funds) but also gives adequate or appropriate weight to the structure and content of devolution, as manifested in the agency to whom the power is transferred (functionary) and the purpose for which the power is transferred (function). This comprehensive nature of the index makes it distinct from and robust compared to the earlier measures which capture only 2-3 indicators of decentralisation (see for example Mahal et al. 2000; Asfaw et al. 2004 studies) while examining its impact on health outcomes. This index is constructed for 16

major states of India for the year 2006-07. The scaling score method is applied (Appendix A). This index is called Devolution Index for Health (DIH) in our study. This index is used to see the effectiveness of rural health spending in the states where local institutions are functionally, financially and administratively viable and vice-versa.

Beside DIH, some time series indices, namely, index of fiscal and political decentralisation have also been constructed, particularly to compare the findings with those of other studies like Mahal et al., [2000] and Asfaw et al. [2004]. As far as the importance of these indices, it is argued that decentralising the budget (fiscal decentralisation - which provides responsibilities to local bodies relating to revenue raising, expenditure allocations and other finances) is the most important step in decentralisation, which enables the local governments to meet the needs of the people and better provisioning of local services, such as the health. However, its effectiveness also requires calibration with other dimensions, particularly with political and administrative decentralisation. The political participation brings decision making closer to the people and thereby increases democratisation. Without political decentralisation participatory decision-making seems to be impossible. The political participation helps in deciding the preferences of local residents. A more active political participation of the population, particularly of the women, is expected to align the decisions of local authorities to the interests and priorities of the population [Asfaw, et al., 2004]. Thus, political decentralisation strengthens the effectiveness of fiscal decentralisation.

Therefore, a political participation index (PPI) is constructed by giving more weight to women representative in assembly and panchayat level politics (Appendix A). This index provides a better understanding of citizens' participation as well as the level of democracy in a particular state. The fiscal decentralisation index is constructed

by using the share of local Panchayat's own revenue in total expenditure of Panchayat. This is a legitimate indicator of fiscal decentralisation since it measures the autonomy of Panchayati Raj Institutions (PRIs) to meet the expenditure of their locality or the fiscal capacity of PRIs to meet their expenses. This also shows the fiscal dependency of PRIs on top authorities like the Centre and State governments. These indices are constructed for the period from 1990 to 2005 for 16 major states of India.

3. DATA, METHODS AND ESTIMATION PROCEDURE

As discussed, the aim of this study is to evaluate the impact of health expenditure and decentralisation on health outcomes and effectiveness of decentralisation in improving the efficacy of public spending. For this purpose, it is important to highlight what and which types of expenditure are relevant for rural health outcomes. It is argued that resource allocation (public spending) may distort the health outcomes if the public health policies are not well-targeted in order to improve child health [Hu, B. and Mendoza R., 2010] and quantum of spending, say, towards high-tech equipment or advanced hospitals may have little effect on public health if morbidity indicators show the need for increased resources for targeted primary care in rural area [NRHM, 2005]. Furthermore, low/inadequate and improper allocation of public funds on essential medicines, drugs and equipment limits the health staff to perform better [Hooda, 2013] and allotted funds may yield little benefit if easy access to water and sanitation facilities are lacking [Deolalikar, 2004]. Thus, the quantum of health spending that are allocated in the rural area (targeted spending in rural area) can be of great significance for rural health outcomes.

Further, in addition to decentralisation and health spending which helps in provisioning of health services in the country, the health outcomes of a region/state also depend on factors like level of development (per capita income), level of

female literacy, provisioning of health services, access of drinking water facilities, status of healthcare use in a state, etc.

To substantiate these arguments, first, the graphical association between comprehensive measures of decentralisation (DIH) and rural health outcomes is presented. Then, the cross-sectional and panel regression equations, controlling for socio-economic factors, are estimated. The idea to estimate the different equations is to present robust results, controlling for other factors, of the impact of decentralisation and health expenditure/infrastructure on rural health outcomes. The estimated equations are as follow:

Panel Equations

$$\ln\text{IMR}_{st} = \alpha + \beta_1 \ln\text{RHE}_{st} + \beta_2 (\ln\text{RHE} * \text{DIH})_{st} + \beta_3 \ln\text{IFD}_{st} + \beta_4 \text{PPI}_{st} + \beta_5 \text{FLR}_{st} + \beta_6 \text{LD}_{st} + \nu_s \varepsilon_{st} \dots(1)$$

$$\ln\text{IMR}_{st} = \alpha + \beta_1 \ln\text{RHE}_{st} + \beta_2 \text{DIH}_{st} + \beta_3 \ln\text{IFD}_{st} + \beta_4 \ln\text{IFD} * \text{PPI}_{st} + \beta_5 \text{FLR}_{st} + \beta_6 \text{LD}_{st} + \nu_s \varepsilon_{st} \dots(2)$$

- IMR - infant mortality rate of rural areas of a particular state
- RHE - per capita public expenditure on health of rural areas of a state at 1993-94 prices, which includes expenditure on medical, public health, family welfare and water supply
- DIH - Devolution index for health - a decentralised governance index
- IFD - Index of fiscal decentralisation: PRIs own revenue as a ratio of their total expenditure¹⁰
- PPI - Political participation index,
- LD - level of development (real per capita income of a particular state at 1993-94 prices)
- FLR - female literacy rate of rural area

- lnIFD*PPI dummy - interaction term of fiscal and political decentralisation, reflecting the effectiveness of political participation in improving the efficacy of fiscal decentralisation. This specifically shows whether high fiscal decentralisation affects the health outcome irrespective of the level of political participation.
- lnRHE*DIH dummy - interaction terms of rural health spending (RHE) and DIH dummy variables. This shows the effectiveness of DIH in improving the efficacy of health spending to have significant effect on health outcomes.¹¹
- ν - State specific residual,
- ϵ - Standard residual with the usual assumptions of zero mean, being uncorrelated with ν and other explanatory variables, and homoscedasticity,
- s - State (16 major states of India),
- t - Time period (1990 to 2005)

- i - number of observations, here it is the number of districts (504) across 19 major states of India

Cross-Sectional Equation

$$U5MR_i = \alpha + \beta_1 RHII_i + \beta_2 RHII*DIH_i + \beta_3 FLR_i \beta_4 UI_i + \beta_5 DW_i + u_i \dots\dots(3)$$

- U5MR - rural under five mortality rate of a district
- RHII - index of health infrastructure in rural area,¹² used as a proxy for health expenditure.
- DIH - devolution index for health, used in dichotomous form (0 for low DIH value and 1 for high - higher than average value).
- RHII*DIH dummy - interaction term of health infrastructure and decentralisation dummy, reflecting the effectiveness of decentralisation in improving the efficacy of rural health infrastructure.
- FLR - female literacy rate of rural area (2001)
- UI - index of maternal and child health (MCH) care use¹³
- DW - percentage of households using safe drinking water (2001)¹⁴

The equation (3) is estimated by applying Ordinary Least Squares (OLS). The panel equations (1 & 2) can be estimated as ‘between effects-BE’, ‘fixed effects-FE’, and ‘random effects-RE’ models, depending on the assumptions we made about the distribution of ν_s and ϵ_{st} . In the BE specification, the coefficients will be estimated using only the cross sectional information on the means of the dependent and explanatory variables over time. In the FE model, also known as ‘within effect’, ν_s is assumed to be fixed, and the coefficients of the parameters will be estimated using the time-series information in the data.¹⁵ This implies that time invariant variables will not be considered. This means that the model allows for different constant for each group/state. In order to allow for different constants for each group/state, it includes a dummy variable for each group/state. This method is known as the Least Squares Dummy Variable (LSDV) method of estimating fixed effects in panel regression. Thus, FE model has some weaknesses as: (i) it ignores all explanatory variables which do not vary over time. By this we mean that it does not allow us to use other dummies in the model, which is particularly inconvenient when we have reasons to consider including such dummies; (ii) if one uses state dummy, the model is inefficient in the sense that it estimates a very large number of parameters, leading to loss in degree of freedom and (iii) it makes it very hard for any slowly changing explanatory variables to be included in the model, because they will be highly collinear with the effects. Thus, even if the F-test (like, the Hausman test) suggests, the FE model may not be used or the model may have to be specified very carefully. In order to avoid the limitations of FE model, the study employs RE model.

The random effects model, on the other hand, takes ν_i as a random variable and assumes ν_i not to be correlated with the other explanatory variables. Then it takes a weighted average of the between and the fixed estimates [Greene, 2008]. The advantage of RE is that it treats constant for each section not as fixed, but as random parameters. That is, RE assumes individual effects are uncorrelated with the explanatory variables, which is one of the necessary conditions for applying the weighted least square method. Thus, RE estimates measure the impact of decentralisation and health expenditure on rural infant mortality by considering the information across states and within a state and assuming individual effects are uncorrelated with explanatory variables. The equations (1 and 2), therefore, are estimated with random effect. The detail of data sources is presented in Appendix E.

4. LIMITATIONS OF THE STUDY

This study, based on some qualitative and quantitative indicators (presented in Appendices A to D), quantify the extent of a comprehensive measure of decentralisation (namely, DIH) across major states of India. The index was constructed using scaling score method. This method, however, has some limitations, as one can lose information pertaining to institutional setting if one takes a number of binary indicators and combines these with quantitative indicators, after converting the latter into discrete values. For instance, giving equal weights to all functions of the Panchayats or their sources of tax and non-tax revenue and then combining the different dimensions by assigning equal weights can be questioned as this rules out judgmental factors emerging from field knowledge or experience. However, we could not think of any systematic method to associate different judgmental weights to different functions of the Panchayats or to different sources of their tax and non-tax revenues.

Further, lower revenue of local bodies may reflect not necessarily absence of decentralisation, as we have assumed, but the local body's poor economic base. However, in order to address this limitation, one needs to examine what determines the revenue of local bodies (whether it is poor economic base or low tax base or the number of taxable items on which the PRIs can impose tax, and so on). We have not carried out such an exercise as it would have taken us much beyond the present scope of our study.

Secondly, DIH requires broad based information and content to make it comprehensive in nature. The information on these indicators (presented in Appendix A) is not readily available for a longer period of time. The DIH, therefore, was constructed at one point of time and then associations with rural health outcomes were presented by considering state and district as cross-sectional units. To present robust estimates across space (states) and time, the study has further constructed two (other important measures of decentralisation in governance, discussed above) time series indices of decentralisation, namely, indices of fiscal and political decentralisation for the period from 1990-2005 across major Indian states and values of the other variables are collected for the same period.

Exploring data only up to 2005 is again one of the limitations of the study. There are two reasons that restrict us to explore data only up to 2005 for regression analysis. One, the information on PRI's revenue and expenditure which are utilised for constructing the index of fiscal decentralisation (IFD) were showing a high jump in the trends of values before and after 2005. Any major distortion in the trends of a series may very well affect the overall significance of the model as well as of that particular variable. Even if we were some how to address the problem of the shift in the trend after 2005 by use of an appropriate dummy variable, as explained in the following

paragraph, it was extremely difficult to construct the time series for expenditure on rural expenditure after 2005 required for such an analysis.

As discussed, the purpose of the present study was not only to examine the effectiveness of decentralisation but also to evaluate the impact of government spending that is allocated in the rural health sector on health outcomes (not merely of aggregate rural plus urban spending). Getting time series data on rural health spending across states, particularly after 2005, became difficult for the following reason. In April 2005, the government of India launched the National Rural Health Mission (NRHM). Under NRHM, the government committed to increase the health spending to 2-3 percent of GDP. Along with this commitment, a structural shift in the routes of transfer of central funds to states has also taken place. For instance, some of the central funds, which were earlier routed through state budget via centrally sponsored and plan schemes, started bypassing the state budgets after NRHM implementation. Most of the NRHM funds that were allocated in rural health sector now are implemented through state implementing agencies (like, the rural health centres-CHCs, PHCs, SCs) as well as decentralised agencies (like, the Panchayati Raj Institutions) [Hooda, 2013]. This changing route of central transfers has made it complex and difficult to work out the expenditure data on health that is allocated in the rural areas, especially after the year of 2005, which enforces us to explore data only upto 2005.¹⁶

5. SUMMARY STATISTICS

It is seen from Tables 1 & 2 that there exists high variation in indicators like health outcomes, health expenditure/infrastructure, education status and the level of development of a state. The correlation matrix between these indicators reflects that health outcomes are highly correlated with some of the indicators, but not with others

(Table 3). How these indicators have impacted the health outcome variables is described in the following section.

6. RESULTS AND DISCUSSION

First, how different Indian states have performed in securing high decentralisation score is discussed. The results show that status of decentralised governance, the devolution of health related funds, functions and functionaries (3F) powers to PRIs (DIH), is high in states like Kerala, West Bengal, Karnataka and Tamil Nadu and low in high income states like Punjab and Gujarat as well as in a low income state like Bihar (Figure 1). The variation and low value of devolution index (DIH) may be because of unbalancing nature of the devolution of 3Fs powers to PRIs. For instance, Figure 2 reveals that in some of the states, functions have not been fully transferred. Activity mapping¹⁷ was to be carried out to clarify the role of PRIs at different levels. This also has not been carried out in some states. The states like, West Bengal, Assam, Karnataka and Maharashtra, have scored high value in functions devolution, but the score values are noticed to be low in finance devolution, indicating that the SFCs in these states devolved low funds to meet the requirement of the functions which have already been assigned to PRIs. Assigning more functions with low funds certainly may hamper the degree of autonomy to PRIs in determining their spending priorities for different functions. This may mean that most of the revenue raising and expenditure allocation priorities are with the state government and PRIs are left with meagre resources. The other reasons for low level of finances sub-indices include low spending by PRIs on core services which are planned and budgeted by the state governments, inappropriate criteria of SFCs for funds devolution from state to PRIs, etc., which are reflected from Appendices B to D. The performance of functionaries' sub-indices also shows similar trends with high variability across states. Thus, uniformity in different sub-indices dimensions is lacking in

many states. Such unbalancing nature of different dimensions undermines the functioning of the inter-governmental transfer system. It can be argued that unless the imbalance is corrected through greater fiscal and administrative decentralisation, Indian states are unlikely to evolve effective PRIs. In short, in order for decentralisation to be effective, it needs to be balanced along the three (3Fs) key dimensions.

The political participation index (PPI) is high in most of the Indian states (Figure 1) and even its score value turns out to be more than the DIH value. It may be because political participation in a democratic country like India is much easier to achieve than vesting the local bodies with administrative control over significant functions or fiscal autonomy. Thus, our construction of the indices of decentralisation and of political participation reveals that the devolution of powers and responsibilities and the outcomes of political processes and the speed of implementation vary across states and within a state through time, depending on the initiatives taken by the respective state governments. This results in variation in decentralisation among the Indian states and low level of decentralisation in some of the Indian states. With varying degree of decentralisation, one can expect the differential impact of it on outcomes of health sector as well as on the effectiveness of health spending.

The graphical presentation of the association between the extent of decentralisation (DIH) and infant mortality rate of rural area shows negative relationship (Figure 3). The estimated linear regression equation of this bivariate association shows that a one basis point increment in the value of decentralisation (DIH) reduces the infant mortality rate of rural area by -0.61 and the coefficient is significant at 10 per cent level of significance. The coefficient of determination R^2 value indicates that 19 percent variation in rural

IMR is explained by the level of DIH. Overall, the extent of decentralisation leads to a lower infant mortality rate in rural area.

The correlation between IMR and DIH turns out to be highly significant (at 5 percent level of significance) with negative coefficient value of about -0.43 (Table 4). Interestingly, the correlation between rural IMR and General devolution index (DI) turns out to be insignificant with a low coefficient value (Table 4). This indicates that a move from General DI to health DI results in lowering the rural IMR, the most. Further, an examination of the association between different dimensions, (i.e., sub-indices) of decentralisation and IMR provides more robust results, as it provides a fairly good idea about the importance of a sub-index for better health sector outcomes. The correlation coefficients between these decentralisation sub-indices and IMR, presented in Table 4, show that finances devolution sub-index is negatively associated with IMR (with coefficient value about -0.48) at 5 percent level of significance. This analysis reflects two important points, one, a move from general devolution of 3Fs powers to PRIs to devolution of health related 3Fs powers to PRIs is more significant in lowering the infant mortality rate of the rural area of India, indicating sector specific devolution of powers is more important for better outcomes of that particular sector and two, of the 3Fs, the devolution of finances powers to PRIs is more important in reducing the IMR.

The panel estimation results show that both decentralisation as well as public expenditure on health (RHE) helps in reducing the infant mortality rate of rural area significantly. A one percent increase in real per capita rural health spending reduces the rural infant mortality rate by about 0.045 per cent at 10 per cent level of significance (Model-I, Table 5). The IMR and expenditure variables are used in log form; the coefficient of expenditure therefore reflects the expenditure elasticity of rural infant mortality rate. The

coefficient shows that the expenditure elasticity of rural infant mortality rate is very low. The low coefficient value of health expenditure may be because, the health spending in India is highly biased towards salary components, while the expenditure on non-salary components (namely, drugs, medicines, machinery and equipments) is low and/or lacking [Hooda, 2013]. A low level of spending on non-salary components is an indication of low availability of these facilities with the government hospitals and primary health centres. Such trends limit the health personal to perform better; it can further reduce the faith in public facility and enforces the rural households to use expensive private health facilities which are located in the urban area and purchasing of medicines from outside store. This may result in high out-of-pocket expenditure and increased financial burden on rural households. Thus, productive and beneficial impact of public expenditure on health in influencing the performance of health sector largely depends on how much funds are allocated to health sector and how funds are allocated within this sector.

The estimates show that a one percentage point improvement in the value of fiscal decentralisation index reduces the infant mortality rate of rural area significantly about 0.023 per cent, at 1 per cent level of significance. Similarly, a one percentage point increment in the Index of political participation, particularly the women's participation, reduces the infant mortality rate of rural area about 0.24 per cent, again at one per cent level of significance. Both the control variables like, the level of female education as well as the level of state's income, are significant in reducing the infant mortality rate of rural area of India at the state level.

The states with high fiscal and political decentralisation indices have more significant impact in reducing the rural IMR compared to the states that have high fiscal but low political

decentralisation index. Thus, political decentralisation increases the efficacy of fiscal decentralisation in reducing the rural IMR. This may mean that high women participation in politics is important for better utilisation of local funds which further leads to better health outcomes of the rural area.

The level of public expenditure on health also turned out to be significant in reducing the infant mortality rate of rural area. The efficacy of public health spending, in improving the rural IMR, increases with the level of decentralisation (DIH) in the states. The results show that a one percent increase in per capita public spending on health lowers the rural IMR by 0.052 percent in states with high decentralisation compared to the low decentralisation states. Thus, decentralisation improves the efficacy of rural health spending in reducing the rural IMR.

Interestingly, among the different measures of decentralisation, namely, fiscal, political and comprehensive measure of health related decentralisation (DIH), the comprehensive measure of health related decentralisation shows greater impact in reducing the rural infant mortality rates. The value of the coefficient of comprehensive measure of health related decentralisation even turned out to be greater than the other socio-economic control variables that are used in the study (Model-II, Table 5).

The cross-sectional estimates show that availability of rural health infrastructure not only turned insignificant in reducing under-five mortality rate of rural area but its sign also turned positive, which is contrary to our expectation. This may be because of inadequate availability and low quality of health services in rural area, which are lacking either in terms of staffing or medicines or equipments. Inadequate availability of health facilities may be one of the factors responsible for not having a significant impact in reducing the U5MR of rural area. Interestingly,

the availability of health infrastructure, however, turns out to be highly significant in reducing the under five mortality rate in states with high level of decentralisation (DIH), compared to states with low health related decentralisation index (Model-III, Table 5). This indicates that effectiveness of the availability of rural health infrastructure increases with the extent of governance in the health sector which is measured in terms of devolution index for health (DIH) in the study. Thus, decentralised delivery mechanism is important for effective delivery of services and better health outcomes. The control variables like, level of female literacy and status of utilisation of maternal and child care also turn out to be significant in reducing the U5MR of rural area.

These findings confirm that a comprehensive measure of health related decentralisation, high participation of women in politics and decentralising the budget all improve the infant mortality rate of rural area significantly both directly as well as indirectly via improving the efficacy of public health spending/infrastructure in their impact on health outcomes of rural area. Thus, devolving adequate funds, functions and functionaries powers to local bodies increase the effectiveness of resource utilisation as also significantly reduces the infant and under five mortality rates. The results suggest that state government needs to devolve adequate powers, authorities and responsibility to rural local bodies. Some states have devolved adequate powers to PRIs but some have not. Out of the score value 100, the Kerala scored a high value of 83 and Punjab a low value of about (39) (Figure 1). The devolution of 3Fs powers to PRIs also seems to be unbalanced in nature in Indian states. In some states, the finances have devolved but not the functionaries and functions. Some have devolved all the 29 functions but devolved low funds to meet the requirements of these functions. This affects the effective delivery system, particularly the health services, in the state. Further, the status

of fiscal decentralisation also seems to be low in India. This indicates that there is low revenue raising capacity (or fiscal autonomy) with the rural local bodies to meet the expenditure requirements of their locality. The share of total expenditure of PRIs in total expenditure of state governments (all states combined) is also very low in India (at about 6-7%). While, in most of the advanced countries local governments normally account for about 20-35 per cent of total government expenditure [Hooda, 2012]. This certainly affects the effective delivery of public services across the Indian states.

7. CONCLUSION

The study finds that government health spending in the rural area helps in reducing the rural infant mortality rates significantly. Interestingly, this expenditure category turned out to be more significant, with a high coefficient value, in reducing the rural infant mortality rates in states with high level of decentralisation compared to those with low level of decentralisation. Thus, the extent of decentralisation improves the efficacy of rural health spending in its impact in reducing the rural infant mortality rate of India. The extent of decentralisation is associated negatively with rural IMR. Thus, decentralisation ensures better health outcomes via improving the efficiency of resources utilisation of rural area.

The fiscal and political decentralisation also plays a significant role in reducing the infant mortality rate of rural area of India. The effectiveness of fiscal decentralisation in reducing the rural IMR increases with the level of political decentralisation. The regression analysis reveals that states with high fiscal *and* political decentralisation have a greater impact in reducing the rural IMR compared to the states with high fiscal but low political decentralisation. Thus, political decentralisation increases the efficacy of fiscal decentralisation in reducing the infant mortality rates of rural area of India.

Along with the level, the allocation pattern of health expenditure (particularly more on drugs, medicines, machinery and equipments) is important for health sector to perform better. Thus, in one sense, the productive and beneficial impact of public health spending in influencing the health sector performance largely depends on how much funds are allocated to health sector under a more decentralised mechanism and how the funds are allocated within this sector. The impact of other control variables like female literacy rate and the level of development of the states at the same time cannot be ignored, as they also play a significant role in reducing the rural IMR.

The inadequate availability of rural health infrastructure will not be helpful in improving the health outcome (like the under-five mortality rates) of rural India. In order to reap the expected outcomes, adequate and comprehensive public health facilities need to be provided across districts and remote rural regions of India. It would be better if these facilities could be provided under more decentralised governance system, as decentralisation improves the efficacy of the existing health facilities in improving the health outcomes. Higher level of female literacy and status of healthcare utilisation for maternal and child care further add to improving the U5MR of rural area. Thus, along with other contributing factors, the adequacy of public health facilities and decentralised service delivery mechanism matter more in improving the health outcomes of rural areas. The adequacy of public health facilities is particularly important in view of the fact that publicly provided health facilities are the single most important source, with private facilities missing, in the rural area.

Overall, the study finds that decentralised governance and public expenditure on health in the rural area and adequate availability of health facilities are more likely to improve health sector outcomes of rural area across the Indian states.

The role of decentralised governance can be seen as a way to increase the efficacy of resource utilisation as well as in ensuring better health outcomes in the country. The findings demonstrate that both *state interventions and institutional change like decentralisation* are important in improving the performance of rural health sector. These findings are consistent with the theoretical arguments and other empirical findings on the subject, as discussed above. These factors, therefore, need to be strengthened to reform the Indian health sector. The study specifically recommends that along with the increase in government spending in the rural health sector, Indian states need to devolve adequate powers (at least as prescribed in 73rd CAA) and authorities over funds, functions and functionaries to rural local bodies so as to improve the performance of public health care system of rural India.

NOTES

1. For instance, Mahal et al., (2000) study in Indian context used states that have moved towards decentralisation during the period 1970-94 as a measure of decentralisation which is identified by knowing the frequency of rural local body election (a proxy of decentralisation) and decentralisation is used in dummy variable form.

2. Like, Asfaw et al., 2004] uses share of local expenditure in the total state government expenditure, the total local expenditure per rural population and the share of local own revenue in the total local expenditure, for the period 1990-1997. Using these indicators an index of decentralisation - named as fiscal decentralisation, was created. This study also used political decentralisation index measured by taking into account the indicators on total voter's turnout, women's participation in polls and the number of polling stations per elector for 14 major states of India. But the comprehensive dimensions of decentralisation have not been utilised.

3. In literature, these mortality indicators are considered superior to life expectancy, an alternative measure of health status. It reflects the infant, child and maternal health, in addition to the state of health development within the society. Further, the variables like IMR are based on actual data whereas life expectancy figures are based on extrapolations from child mortality data and assumed life tables. Secondly, rural infant and under five mortality rates are more sensitive to a policy reform such as decentralisation and level and allocation pattern of public spending on health in the rural area than any other health outcomes like the life expectancy.

4. Under this Act, from political standpoint, there is a provision of three tiers of panchayats, namely, at village, intermediate and district levels. This Act not only gave discretionary political power to states to devolve power to Panchayati Raj Institutions (PRIs) but also sought to protect the political rights of hitherto neglected groups such as Schedule Castes, Tribes and Women by providing them reservation in politics. This involves the provisions for greater participation of backward and deprived sections of the society in decision making.

5. The SEC helps to ensure improved democracy by ensuring regular, free and fair elections at the local level in every five years.

6. The SFC is constituted, every five years, to govern the distribution and devolution of financial resources so as to improve the financial position of the panchayats across the districts within a state.

7. The DPC involves in planning processes and the plans of the Panchayats and Urban Local Bodies in a district will be consolidated by DPCs. All Panchayats are to engage in (economic development and social justice) planning processes under the mandatory action of Constitution. Plans of the Panchayats and Urban Local Bodies in a district are to be consolidated by the District Planning Committees (DPCs). If the Constitutional mandate were to be operationalising, minimally, such bodies should be formed and appropriately resourced.

8. The Gram Sabha or village council has been envisaged as foundation of the Panchayati Raj system as it ensures community participation.

9. The functions are ranging from drinking water, agriculture, poverty alleviation programmes; health & family welfare, education, libraries and cultural activities, maintenance of community assets, etc.

10. Further, to check the robustness of the result, an index of fiscal decentralisation is also constructed, using share of PRIs own revenue in total expenditure/revenue of PRIs and in total revenue of state. The estimated results of these indices show just minor changes in the coefficient values, but their signs and significance remained unaffected. However, these results were not reported in the text in order to avoid the confusion in reporting the impact of fiscal decentralisation and to avoid reporting more estimated equations.

11. The dummy of DIH takes 0 for low and 1 for high index value (higher than average). This index however is constructed for the year 2006 but the dummy value is used for the period from 1990 to 2005. This is because states with high DIH value have also taken adequate initiative to implement the decentralised concept from the inception of 73rd CAA from 1992-93 [Hooda, 2012].

12. Health expenditure data at district level is not available; this variable therefore is used as its proxy. This infrastructure index is constructed by using No. of CHCs, No. of PHCs and No. of SCs in rural area per 100,000 population across districts using Principal Component Analysis (PCA).

13. The status of MCH care use is expected to improve U5MR. This is estimated by using, women receiving 3 or more ANC visits, women receiving 2 TT injections and child immunisation coverage rate by applying PCA for the year 2003-04.

14. As most of the diseases are caused by unsafe drinking water and are a cause of child death in the early age, it is expected that a high percentage of use of safe drinking water in a particular district helps in reducing the under five mortality rate.

15. As the number of years of observations used here is small, it is obvious that the Least Squares Dummy Variable (LSDV) method of estimating fixed effects panel regression is not possible in our case. Not only that, but even individual state-wise regressions (for equation 1 and 2) were not worth estimating, as the number of years for which data were available was 15 (1990-2005) and 5-6 explanatory variables were to be introduced. Thus, even in this case, the degrees of freedom (*df.*) would be very low. A low *df.* decreases the chance of rejecting the null hypothesis and increases the probability of accepting the false hypothesis [Gujarati, 2003, Chapter-V].

16. Estimates between 2005 and 2008 show that on an average over 60 per cent of all central government health allocations are now allocated under NRHM, which, however, fluctuate across the years. Out of these NRHM allocations, around 69 per cent bypasses the state's budget and rest of the funds (31 per cent) flow through the state treasuries and are reflected in the state health budget [Berman and Ahuja, 2008]. The Ministry of Health and Family Welfare (MOHFW), *NRHM expenditure statement*, compiles 'total' central funds that are allocated in various NRHM schemes. But, of the total, 31 per cent NRHM funds (mentioned above) are also reflected in state budget document. Thus, there is a problem of overlapping of 31 per cent central funds both in MOHFW and state's budget documents, which are allocated under various health schemes. Similarly, state governments also allocate funds in NRHM schemes and some of the funds are reported in both state budgets as well as in NRHM expenditure statements document of MOHFW. Thus, to work out the total rural health spending, a detailed examination of individual schemes is required, which would be a separate study.

17. The assignment of duties to functionaries across PRIs should be based on detailed Activity Mapping. As, activity mapping is a way of unbundling subjects into component activities and mapping them against functions devolved to the

panchayats by law. Thus, inclusion of activity mapping in indices analysis is the first step towards high 'quality' of devolution and strengthens the index of decentralisation.

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Table 1. Selected Health Outcomes, Health Expenditure and Decentralisation Indicators at State Level

States	Rural IMR		Rural Female Literacy Rate		Real Per Capita GSDP (Rs.)		Fiscal Decentralisation Index		Real Per Capita Public Health Expenditure in Rural Area (Rs.)	
	1991	2005	1991	2005	1991	2005	1991	2005	1991	2005
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Andhra Pradesh	77	62	23.9	56.8	7814	13360	7.2	3.0	35	61
Assam	83	70	39.2	58.6	6302	7696	37.1	98.2	59	65
Bihar	71	62	18.0	36.9	4864	5079	20.1	3.6	43	46
Gujarat	73	62	38.7	48.9	10368	20497	2.3	2.8	63	171
Haryana	73	62	32.5	59.0	12683	18690	49.6	13.1	74	124
Himachal Pradesh	76	52	49.8	72.7	8464	14908	11.8	23.7	258	331
Karnataka	87	53	34.8	55.4	7483	14539	1.2	1.3	3	44
Kerala	17	16	85.1	87.5	7753	15401	47.4	15.1	42	45
Madhya Pradesh	125	79	19.7	58.6	7208	9611	6.6	47.7	48	26
Maharashtra	69	42	41.0	68.5	11640	19375	2.2	11.6	48	62
Orissa	129	76	30.8	56.0	4990	7677	4.8	2.1	38	42
Punjab	58	48	43.9	64.7	13104	18280	21.4	49.8	71	108
Rajasthan	84	74	11.6	60.5	7481	10819	3.5	2.0	121	77
Tamil Nadu	65	39	41.8	62.7	8878	16035	9.7	11.3	62	200
Uttar Pradesh	102	75	19.0	49.6	5982	8123	5.5	9.8	53	54
West Bengal	76	40	38.1	61.8	6682	13528	4.5	22.8	33	46

Note: Per capita GSDP and health expenditure are at 1993-94 prices.

Source: Reported from Hooda, [2012].

**Table 2. Selected Health Outcomes, Health Infrastructure and Literacy Indicators by States
(District-wise average value #)**

States	U5MR	Value of Health Infrastructure Index	Female Literacy Rate	Index Value of MCH Care Status	Drinking Water Facility
(1)	(2)	(3)	(4)	(5)	(6)
Andhra Pradesh	75	0.47	50.0	0.81	80.4
Assam	115	0.56	55.8	0.37	55.5
Bihar	107	0.32	32.9	0.34	83.8
Chhatisgarh	134	0.46	51.0	0.60	68.1
Gujarat	83	0.75	56.3	0.65	80.8
Haryana	103	0.50	57.1	0.66	86.2
Himachal Pradesh	93	1.86	64.8	0.70	88.3
Jharkhand	100	0.43	36.2	0.40	41.0
Karnataka	79	0.80	58.0	0.82	81.8
Kerala	57	0.63	86.8	0.93	22.0
Madhya Pradesh	147	0.53	49.5	0.43	68.0
Maharashtra	74	0.57	64.6	0.78	75.2
Orissa	132	0.72	47.9	0.60	64.5
Punjab	88	0.61	62.4	0.77	97.4
Rajasthan	120	0.70	42.5	0.38	67.1
Tamil Nadu	84	0.48	63.9	0.97	84.8
Uttar Pradesh	131	0.43	42.5	0.35	86.5
Uttaranchal	94	0.76	59.4	0.48	82.4
West Bengal	103	0.31	57.2	0.68	84.2
Average	101	0.63	54.7	0.62	73.6

Note: # - District-wise average values of indicators are presented.
Source: Reported from Hooda, [2012].

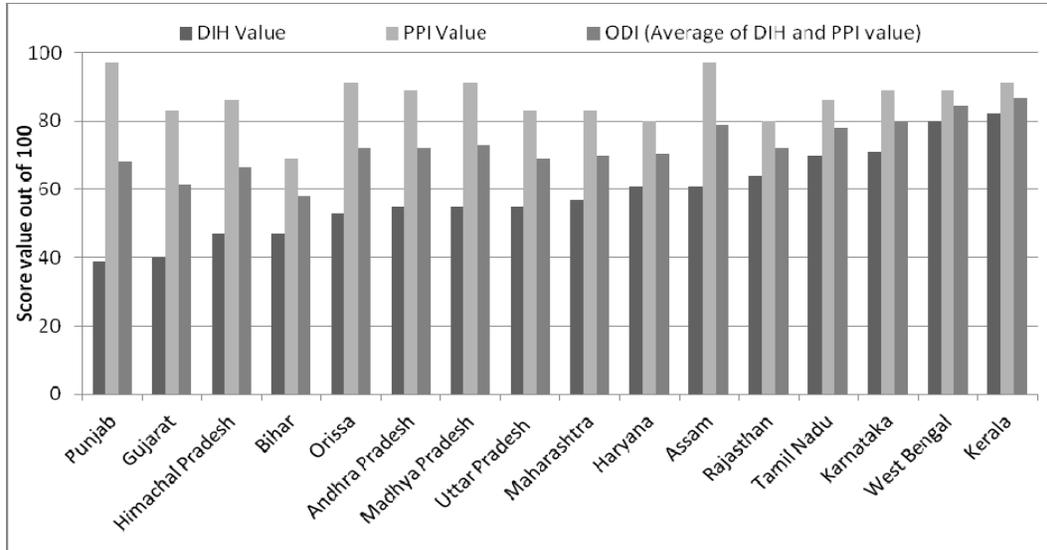
Table 3. Correlation Coefficients between Health Expenditure, Decentralisation and Outcomes Variables

	A	B	C	D	E	F	G	H	I	J	K	L	M
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
A	1.00												
B	-0.13	1.00											
C	-0.27	0.23	1.00										
D	-0.39	0.11	0.01	1.00									
E	-0.37	-0.41	-0.01	0.28	1.00								
F	-0.30	-0.03	0.19	0.20	0.75	1.00							
G	-0.39	0.05	0.53	0.53	0.21	0.17	1.00						
H	-0.28	-0.01	0.57	0.30	0.09	0.15	0.80	1.00					
I	-0.80	0.22	0.29	0.58	0.33	0.22	0.44	0.33	1.00				
J	-0.78	0.10	0.25	0.37	0.35	0.20	0.41	0.27	0.84	1.00			
K	-0.50	0.41	0.09	0.39	-0.04	0.13	0.17	0.16	0.54	0.37	1.00		
L	-0.49	0.41	0.06	0.25	-0.20	-0.09	0.17	0.11	0.41	0.46	0.80	1.00	
M	-0.56	0.33	0.02	0.26	-0.03	0.07	0.14	0.09	0.50	0.52	0.80	0.84	1.00

Note: A. Rural IMR; B. Log of real per capita public expenditure on health in rural area (RHE); C. Log of IFD (share of PRIs own revenue in total expenditure of PRIs); D. Log of Political Participation Index (PPI) value; E. Devolution index of health related 3Fs powers to PRIs (DIH) value; F. Interaction term of RHE and DIH dummy (RHE*DIH dummy); G. Interaction term of log of IFD value*PPI dummy (1 for high PPI, 0=otherwise); H. Interaction term of high IFD dummy*high PPI dummy (1 for high, 0= otherwise); I. Rural female literacy rate (continuous variable); J. Rural female literacy rate (FLR) (constant for all years-1991); K. Log of real per capita GSDP; L. Rank of per capita real GSDP (1 = low, 2 = middle, 3 = high income states); M. Per capita GSDP dummy (0 = low and 1 = high income states).

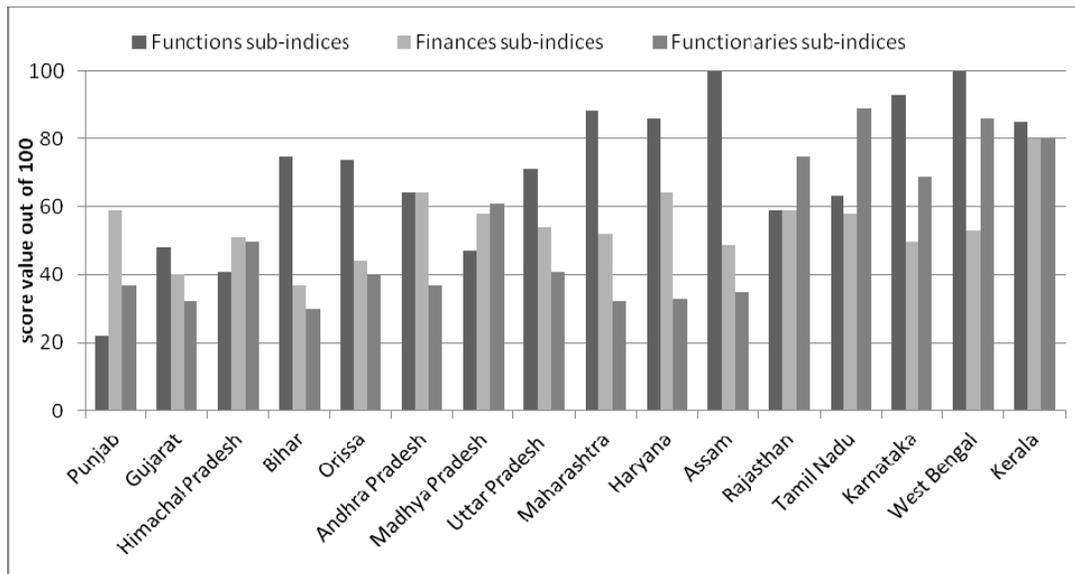
Source: Reported form Hooda, [2012].

Figure 1. Extent of Decentralisation in India across States: 2006



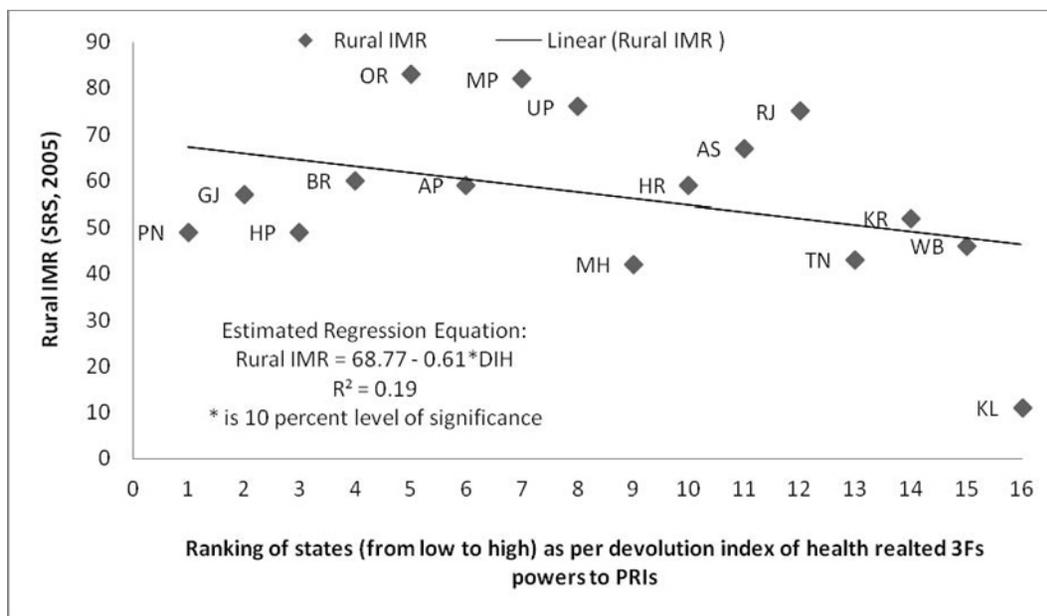
Source: Author's estimates using information from Appendix A and reported from Hooda, [2012].

Figure 2. Nature of Devolution of 3Fs Powers to PRIs across States: 2006



Source: Same as Figure 1.

Figure 3. Extent of Decentralisation and Rural IMR: An Association



Source: Author’s designed and reported from Hooda, [2012]

Table 4. Correlation Coefficient between Decentralisation Indices and Rural IMR

	ODI	PPI	Functions DI	Finances DI	Functionaries DI	DIH	General DI#	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IMR	-0.40	-0.09	-0.17	-0.48*	-0.35	-0.43*	-0.36	

Note: * is 5 percent level of significance. # - Value of General DI is taken from NCAER [2007].

Source: Author’s Estimates using data on IMR and decentralisation indices and reported from Hooda [2012].

Table 5. Impact of Decentralisation and Health Expenditure on Health Outcomes

Model-I: Panel Regression Results with Random Effect

$$\ln\text{IMR} = 5.48 - 0.045\ln\text{RHE} - 0.052(\ln\text{RHE}*\text{DIH}) - 0.023\ln\text{IFD} - 0.242\text{PPI} - 0.018\text{FLR} - 0.122\text{LD}$$

$$(34.51)^* \quad (-1.89)^{***} \quad (-2.24)^* \quad (-2.65)(-7.43)^* \quad (-4.98)^* \quad (-4.35)^*$$

R-sq: Within = 0.40; Between = 0.71; Overall = 0.69; Waldchi2(6) = 191.8; Prob > chi2 = 0.00; sigma_u = 0.23;
sigma_e = 0.09; rho = 0.86

Model-II: Panel Regression Results with Random Effect

$$\ln\text{IMR} = 6.09 - 0.084\ln\text{RHE} - 0.204\text{DIH} - 0.025\ln\text{IFD} - 0.067(\ln\text{IFD}*\text{PPI}) - 0.017\text{FLR} - 0.125\text{LD}$$

$$(21.04)^* \quad (-4.60)^* \quad (-2.09)^{**} \quad (-2.77)^* \quad (-3.07)^* \quad (-4.59)^* \quad (-4.44)$$

*R-sq: Within=0.39; Between =0.75; Overall = 0.73; Waldchi2(6)= 194.2; Prob > chi2 = 0.00;
sigma_u =0.22; sigma_e =0.09 ;rho = 0.85

Model-III: Cross-Sectional Regression Results

$$\ln\text{U5MR} = 5.19 + 0.016\text{RHII} - 0.11(\text{IRHI}*\text{DIH}) - 0.003\text{FLR} - 0.696\text{IU} + 0.0003\text{DW}$$

$$(97.9) \quad (0.59) \quad (-3.23)^* \quad (-3.76)^* \quad (-11.8)^* \quad (0.69)$$

F(5, 498) = 91.87; Prob > F = 0.00; R-squared = 0.480; Adj R-squared = 0.475

Note: Model- I & II: the figures in parenthesis are z-value; Number of obs.=256; years = 1990 to 2005; Number of states=16; The correlation coefficients between these variables are presented in Table 3;

Model-III: Number of observations/districts across major Indian states are 504; figures in parenthesis are t-values;

*, ** & *** are 1, 5 & 10 percent level of significance. Source: Author's Estimates and reported from Hooda [2012]. The notation of variables can be found in Table-3.

Appendix A: Indicators and Methods for Calculating Decentralisation Indices at State Level in India

Political Participation Index	
Constitution of State Election Commission (SEC)	If, Yes = 5, No = 0
Holding Elections to PRIs Every Five Years	If Yes = 5; No = 0
Share of women and reserved class panchayats representatives	If $\leq 25 = 1$; if $> 25 \& \leq 29 = 2$; if $> 29 \& \leq 33 = 3$; if $> 33 \& \leq 37 = 4$; if $> 37 = 5$
% of total voters' turnout in assembly election	If $< 45\% = 1$; $45 \leq 65\% = 3$; $> 65\% = 5$
Total women who voted in assembly election as percentage of men who voted in assembly election	If $< 75\% = 1$; $75-85\% = 3$; $> 85\% = 5$
% of women contestants in assembly election	$< 2\% = 1$; $2 \leq 3\% = 3$; $> 3\% = 5$
% of women elected in assembly election	$< 4\% = 1$; $4 \leq 6\% = 3$; $> 6\% = 5$
Political Participation Index (PPI) #	Arithmetic Mean of all above items is computed and it is normalised to be between 0 and 100 by using the formula: $PPI_i = (PPI_i * 100) / 5$
Sub-Index of Functions Devolution	
De facto transfer of 6 health and health related functions to Panchayats	$[(\text{Number of functions transferred}/6)*5]$
De facto transfer of remaining 23 functions to Panchayats	$[(\text{Number transferred}/23)*5]$
Has activity mapping been conducted on 6 health functions? ##	$[(\text{Number of functions for which Activity Mapping is done}/6)*5]$
Activity mapping has been conducted for the remaining 23 functions?	$[(\text{Number of functions for which Activity Mapping is done}/23)*5]$
a. Functions devolution sub-indices	Arithmetic mean of all Functions items
Sub-Index of Finances Devolution	
Authorisation to the village panchayats as per the PRIs Act to collect appropriate taxes, duties, tolls and Non-taxes fees.	$[(\text{Number of taxes items assigned}/38)*5] [(\text{Number of non-taxes items assigned}/29)*5]$
PRIs own revenue as % of expenditure of PRIs	Less than 5% = 1; 5 - 10% = 2; 11 - 15% = 3; 16 - 20% = 4; More than or equal to 21% = 5
PRIs own revenue as % of state own revenue	Less than 1% = 1; 1-2% = 2; 2-3% = 3; 3-4% = 4; more than 4% = 5
Per capita (as per rural population) real (at 1993-94 prices) expenditure on core services (like, health, education, water supply, street light, roads, etc.) by PRIs	Less than Rs. 50 = 1; 51-100 = 2; 101-150 = 3; 151-200 = 4; more than 200 = 5
Constitution of State Finance Commission (SFC)	If No SFC has been constituted = 0; Only 1st SFC report received = 2; 2nd SFC report received = 3; 3rd SFC report received = 5; (used highest score)

(Contd.)

Appendix A: (Concl.)

Timely Actions on the latest SFC's major recommendations	> Two years = 1; <2 years>one year = 2; < 1 year > six months = 3; < Six months = 5
% of funds devolved to PRIs that are 'untied' to any scheme	<5% are untied=1; 5-25% untied=2; 25-50% untied=3; 50-75% untied=4; >75% untied=5
Release of Funds to PRIs: Compliance of the State Government in Sending the TFC grant without delay (data from NCAER)	>60 Days=1, 45-60=2, 30-45=3, 15-30=4, <15 Days=5
Is the allocation of SFC funds to the PRIs based on an apportionment formula?	If allocation is based on development or equitable criteria and include more than three items = 5, if three items= 4; if two items =3; if one item= 2; if ad-hoc grant = 1
b. Finances devolution sub-indices	Arithmetic mean of all Finance items
Sub-Index of Functionaries Devolution	
whether staff transferred, for instance, whether (i) only general staff transferred; (ii) functionaries of departments transferred but without any control over them by elected representatives; (iii) functionaries of departments transferred with some degree of control invested in the elected representatives (such as sanction of leave); (iv) functionaries transferred and under substantial control of the elected representatives	If item (iv)= 5; if item (iii)=4; if item (ii)=3; if item (i)=1; if no information average of below three items
How many functionaries has been transferred	[(Number of functionaries transferred/29)*5]
General support to Panchayats at present: Government has specified expert institutions and entities to support PRIs for preparation of Annual Plans and for capacity building (data taken from NCAER)	Yes = 5 No = 1
What is the amount of money provided for the training of PRI's elected functionaries in the state budget? (Rs per year per elected functionary) (data taken from NCAER)	Less than or equal to Rs 1000= 1; More than Rs 1000 =5
Has the state's department of Panchayati Raj brought out its Annual Report for the last fiscal year?	Yes=5, No=0
c. Functionaries devolution sub-indices	Arithmetic mean of all Functionaries items
Devolution Index to Health (DIH)###	Arithmetic Mean of a, b & c. The DI value, further, is normalised to be between 0 and 100 by take the formula: $DI_i = (DI_i * 100) / 5$

Note: #-For PPI, the assembly election data for the period from 1992 to 2005 is considered for individual state.

###-Under the Schedule 11 of the 73rd Constitutional Amendment the 29 functions were transferred to PRIs, the activity mapping indicates whether systematic efforts at clarifying the roles and responsibility of PRIs on the transferred functions is carried out or not.

###-The detail of selected indicators is provided in Appendix B to Appendix D.

Source: Detail discussion on indicators can be found in Hooda [2012]

Appendix B: Value of Selected Indicators Used for Devolution Index

	Total functions transferred (in no.)	Functions on which activity mapping has been conducted (in No.)	PRIs authority to collect non-taxes (in No)	PRIs authority to collect taxes/duties/tolls/fees (in No)	PRIs own revenue as % of exp of PRI (avg. of 2000-2004)	PRIs own revenue as % of state's own revenue (Avg. Of 2000-2004)	Real (at 93-94 prices) per capita PRIs' exp on core services (in Rs.) (Avg. of 1998-99 to 2003-04)	Constitution of State Finance Commission (value are based on score)	Timely Actions on the latest SFC's major recommendations (value are based on score)
AP	12	9	22	16	4	1.02	36	3	3
Assam	23	23	11	4	99	0.21	638	5	5
Bihar	25	29	5	0	4	0.16	13	5	1
Gujarat	15	29	16	5	2	0.41	4	3	1
Haryana	23	10	5	2	23	0.94	22	5	5
HP	26	0	7	1	15	0.56	308	5	3
Karnataka	24	23	10	8	1	0.32	5	5	1
Kerala	21	19	11	15	13	2.76	3	5	5
MP	23	20	7	0	30	1.88	370	3	1
Maharashtra	12	23	8	2	9	2.06	125	5	1
Orissa	20	10	4	2	5	0.07	6	3	3
Punjab	20	0	8	2	58	1.03	137	5	5
Rajasthan	29	25	9	1	2	0.40	68	5	5
TN	29	29	11	9	12	0.35	671	5	3
UP	23	27	6	2	11	0.41	0	5	1
West Bengal	23	23	7	6	10	0.37	205	5	1

Appendix B: (Concl.)

	Percentage of funds devolved to PRIs that are 'untied' to any scheme (values are based on score)	Release of Funds to PRIs: Compliance of the State Government in Sending the TFC grant without delay (values are based on score)	Is the allocation of SFC funds to the PRIs based on an apportionment formula? (values are based on score)	Whether staff transferred	How many functionaries transferred	General support to Panchayats at present: Government has specified expert institutions and entities to support PRIs for preparation of Annual Plans and for capacity building	What is the amount of money provided for the training of PRI's elected functionaries in the state budget?	Has the state's department of Panchayati Raj brought out its Annual Report for the last fiscal year?
AP	3	5	5	1	0	1	3	0
Assam	1	1	2	4	0	1	1	0
Bihar	2	5	1	3	3	1	3	0
Gujarat	3	5	1	2	2	1	3	0
Haryana	5	5	1	3	2	1	3	0
HP	2	4	3	4	1	1	3	5
Karnataka	2	5	5	4	3	3	4	5
Kerala	4	5	5	5	3	5	4	0
MP	3	5	4	4	1	1	3	5
Maharashtra	1	5	3	2	2	1	3	0
Orissa	4	5	2	4	2	1	3	0
Punjab	5	1	1	4	1	1	2	0
Rajasthan	4	5	4	3	3	3	4	5
TN	4	5	2	1	5	5	4	5
UP	5	5	3	3	1	0	3	5
West Bengal	2	5	5	3	2	5	3	5

Source: Reported from Hooda, [2012].

Appendix C: Indicators and Criteria Used for funds' Devolution

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Popula- tion/ density/ rural pop	Area	Poverty/ level of per capita Income	Illiteracy rate	Popula- tion of SC/STs	Popula- tion of DDP/ DPAP /TAD	Persons per bed in govt. hospitals /IMR/ other health indicator	Road length/ sq. km	Finan- cial need	Tax effort	Deve- lopment criteria	Index of Decen- trali- sation	Lump sum criteria
AP											Y		
Assam	Y												
Bihar													Y
Gujarat													Y
Haryana													Y
HP	Y	Y											
Karnataka	Y	Y		Y			Y	Y				Y	
Kerala	Y				Y				Y	Y			
MP	Y	Y								Y			
Maharashtra	Y	Y											
Orissa	Y												
Punjab													Y
Rajasthan	Y		Y			Y							
Tamil Nadu	Y												
UP	Y	Y											
West Bengal	Y		Y	Y	Y		Y						

Note: Y - indicates that criteria are adopted for funds devolution.

Source: Reported from Hooda, [2012] and State Finance Commission Reports, individual state.

Appendix D: Criteria Adopted for Funds Devolution by SFCs to Address Horizontal and Vertical Inequalities

(1)	Devolution Recommended		
	SFC-I	SFC-II	SFC-III
(1)	(2)	(3)	(4)
Andhra Pradesh	39.24% of state revenue from tax and non-tax	40.92% per annum of the tax and non-tax revenues of the Government including the share of central taxes to LBs	No information
Assam	2% per annum of tax revenue of the state; and fixed amount of Grants-in-aid: 1996-97: Rs. 36.89 crore; 1998-99: Rs. 37.02 crore; 1999-2000: Rs. 37.02 crore	3.5% per annum of aggregate tax revenue of the state to LBs 2. Grant-in-aid of Rs.10 crore per annum for ULBs	1. No devolution for the year 2006-07; 2. 10% of non loan gross own tax revenue receipts after deducting actual collection charges for the year 2007-08; 3. 25% of non loan gross own tax revenue receipts after deducting actual collection charges for the year 2008-11
Bihar	No information	No information	3% of net proceeds from state

(Contd.)

Appendix D: (Contd.)

(1)	Devolution Recommended		
	SFC-I (2)	SFC-II (3)	SFC-III (4)
Gujarat	Additional taxation of Rs. 293.09 crore per annum	No information	Not constituted
Haryana	1. 20% of royalty on minor minerals be devolved to the ULBs and Gram Panchayats 2. 7.5% of net receipts under 'stamp duty and registration fees' be devolved to PRIs 3. Tax on motor vehicle 20%; entertainment tax 50% to ULBs	1. 20% of annual income from royalty on minor minerals to gram panchayats and municipalities; 2. 3% of the net receipts from 'stamp duty and registration fees' to PRIs; 3. 65% of the net proceeds of LADT to PRIs; 4. 50% of the entertainment tax; 20% of motor vehicle tax and 35% of LADT to ULBs	4% of the net tax revenue to LBs
Himachal Pradesh	Rs. 138.75 crore devolved to LBs	Rs. 253.19 crore devolved to the LBs	Cess on liquor to be transferred to LBs; incentive fund at the rate of Rs. 10 crore to LBs; Gap filling grant of Rs. 228.28 crore. Grant-in-aid to LSGIs; and maintenance expenditure for roads.
Karnataka	36% of non-loan gross own revenue receipts to the LBs	40% of non loan net own revenue receipts to the local bodies; Rs. 5 crore to be common purpose fund each year	1. 33% of state's own revenue receipt to be devolved to PRIs and ULBs in the ratio of 70:30 2. Salary component of officials; working in the PRIs should be delinked while working out the total share of PRIs and ULBs
Kerala	1. 25% surcharge on stamp duty be levied on behalf of ULBs. The surcharge on stamp duty as well as basic tax collected from Corporation area be transferred to them on collection basis;	1. Government may devolve to the LSGIs, plan funds (excluding state sponsored schemes) not less than one-third the annual size of state plan as fixed by government from time to time;	25% of the total state tax revenue of the year 2003-04 be transferred to LBs during the year 2006-07. For subsequent years, annual growth rate of 10% may be applied for transfer of funds to the LBs

(Contd.)

Appendix D: (Contd.)

(1)	Devolution Recommended		
	SFC-I (2)	SFC-II (3)	SFC-III (4)
	2. Land tax be doubled and 60% of the additional income generated there from be given to block panchayats and balance to district panchayats	2. 5.5 per cent of the annual own tax revenue of the state government may be devolved to the LSGIs as Grant-in-aid for maintenance of assets under control of the LSGIs including the transfer of assets; 3. 3.5 per cent of the own tax revenue of the state government based on the figures certified by the accountant general could be devolved to LSGIs as general purpose grant, in lieu of assigned taxes, shared taxes and various statutory and non-statutory grant-in-aid, both specific purpose and general purpose	
Madhya Pradesh	2.91% of total tax and non-tax to PRIs and 0.514% share of the divisible pool to ULBs; specific grant Rs 67.66 crore to PRIs	2.93% of total tax and non-tax to PRIs and 1.07% to ULBs. Assignment of taxes to LBs after deduction of 10% collection charges; establishment grant Rs. 28.40 crore to PRIs and Rs. 5 crore to ZPs for training	No information
Maharashtra	1. 10% of the professional tax collected by the state should be given to LBs; 2. 66.67% of the demand of land revenue and cess thereon should be given to PRIs as advance grants; 3. Irrigation cess grant equal to 66.67% of the demand should be given to zilla parishads as advance grants; 4. 25% of net income from motor vehicle tax be given to ULBs	40% of state's tax, duties, tolls proceeds to the LBs	No information

(Contd.)

Appendix D: (Contd.)

(1)	Devolution Recommended		
	SFC-I	SFC-II	SFC-III
	(2)	(3)	(4)
Orissa	Government is bearing the full salary and other recurring and nonrecurring cost of staff deployed by various line departments in PRIs. The quantum of money to be provided for salary of the staff of panchayat Samities should be treated as direct devolution of funds to RLBs	10% of average of state's gross own tax revenue from 1999-2000 to 2001-02 be devolved to LBs. 10% of the state's gross own tax revenue for the year 2002-03 minus devolvable amount was recommended as grants in-aid for various specific purposes	15% of the average gross tax revenue of the state for the years 2005-06 to 2007-08 @ Rs. 896.17 crore per annum be devolved to the LBs
Punjab	20% of 5 taxes, i.e., stamp duty; motor vehicle tax; electricity duty; entertainment tax; cinema shows be devolved to the LBs (both urban and rural)	4% of net proceeds from all state taxes be devolved to the LBs	4% share of net proceeds of all state taxes be devolved to the LBs
Rajasthan	2.18% of net tax proceeds of the state to be devolved to the local bodies	2.25% of net tax proceeds to the LBs; entertainment tax 15%; royalty on minerals 1%	3.50% of net own tax proceeds of the state; entertainment tax 100%; royalty on minerals 1%
Tamil Nadu	No information	The share of SOTR after excluding entertainment tax of local bodies has been recommended as under: i) 2002-04: 8%; ii) 2004-06: 9%; and iii) for 2006-07: 10%; 5% of the central devolution should also be passed on to the local bodies; 10% of SFC devolution may be used for capital works in municipalities and corporations, 15% by town panchayats and 20% by village panchayats	10% of the state's own tax revenue be devolved to the LBs; Specific purpose grant shall be at 0.5% to 1% of the state's own tax revenue
Uttar Pradesh	4% of net tax proceeds to PRIs; discontinued grants-in-aid; 7% of net tax proceed to ULBs	5% of divisible pool to PRIs; 7.50% of state's net proceeds of tax revenue to ULBs; grants in aid: nil	6% of net tax proceeds to PRIs and 9% to ULBs which is under consideration
West Bengal	Entertainment tax: 90%; road & PW cess: 80%	Annual untied funds of Rs. 350 crore; entertainment and amusement tax 90% to LBs; cess on road and public works 80%	Untied fund of Rs. 850 crore from 2009-10 with annual increase of 12% on a cumulative basis for the subsequent years

Source: Reported from Hooda, [2012].

Appendix E: Data Sources

Variables	Data Sources
(1)	(2)
Level of health expenditure (HE)	Finance Account, state governments, various years; further real per capita expenditure (at 1993-94 prices) is estimated by Author
Level of Development (measured through per capita GSDP) of a state	The original figures on GSDP of states are taken from <i>www.mospi.nic.in</i> and then converted in real per capita GSDP at 1993-94 prices by Authors
Infant mortality rate (IMR) Female literacy	Sample Registration System, Government of India, various years Census of India, GoI, Government of India, select years (1991 and 2001)
Rural health infrastructure index	Constructed using data from Bulletin of Rural Health Statistics, Ministry of Health and family Welfare (2006), Government of India
U5MR, Drinking water, MCH care use	District Level Household Survey on Reproductive and Child Health (DLHS-RCH), International Institute for Population Sciences, Mumbai, (2006), India
Decentralisation index and indices	Broadly discussed in Hooda, [2012]

