Studies
in
Population and Development

No. 12-01

Assessment of District Health System Performance in India

Aalok Ranjan Chaurasia

Shyam Institute

ASSESSMENT OF DISTRICT HEALTH SYSTEM PERFORMANCE IN INDIA

Aalok Ranjan Chaurasia
'Shyam' Institute
aranjan@shyaminstitute.in

Abstract

Using the information available through the District Level Household and Facility Survey 2007-08, this paper measures the performance of the district health system in India on the basis of a composite index of performance that is based on 14 health interventions related to maternal and child health. The analysis indicates that district health system performance varies widely across the districts of the country and there are only a handful of districts where the performance appears to be satisfactory. The geographical distribution of the performance of the district health system suggests a clear north-south divide with performance much better in the southern part of the country. The analysis suggests that there is a need of an analysis of the administrative capacity and organisational efficiency of the district health system to improve its performance. The performance index presented in the paper may serve as the benchmark for monitoring progress in the performance of districts health system in the country.

Key Words

India, health system, performance, maternal health, child immunisation, child health, breastfeeding

Introduction

Health status of the people has been an abiding concern to India's development planning process right since independence. Despite this priority focus, health of the people and its impact on the social and economic production system of the country remains a major development challenge in India. In recent years, India has recorded significant economic growth but gains in the economic front have not been translated in an acceleration in health transition. Current trends suggest that India will be missing Millennium Development Goals in terms of the reduction in child mortality and improvements in maternal health (Government of India, 2012). On the other hand, an application of United Nations mortality transition (United Nations, 2004) model suggests that mortality transition in India has slowed down in recent years (Chaurasia, 2009). India is estimated to account for more than 17 per cent of the average annual number of deaths in the world during the period 2005-10. This proportion is the highest in the world. India also accounts for the highest proportion of global child deaths and global maternal deaths. It has been argued that the pace of global mortality and health transition will depend largely on the pace of mortality and health transition in India.

Unsatisfactory performance of the health care delivery system is one of the many factors attributed to relatively slower health and mortality transition in India. Although, health care is not the only determinant of the health of the people, yet delivery of health care services in the form of life-saving and life-enhancing interventions plays a key role in preventing majority of the premature deaths, yet there is ample evidence to suggest that universal access to quality health care at an affordable cost still remains a distant dream in India.

India's National Rural Health Mission, launched in the year 2005, aims at architectural corrections in the public health care delivery system so to improve its efficiency in meeting the health needs of the people (Government of India, 2005). The Mission follows a decentralised, district-based approach to meeting the health needs of the people and covers the entire country but its primary focus is on 18 priority States where the health situation remains poor. The framework for implementation of the Mission, however, does not outline any mechanism for bench-marking and measuring health system performance. It envisages monitoring progress against pre-set standards which are to be agreed between the community and the health care delivery institution. However, the process of setting up standards and benchmarks remains unspecified.

Measuring health systems performance in terms of meeting the health needs of the people has two dimensions. The first is related to the extent up to which health system is able to reach those who are in need of health care or the needs effectiveness. The second, on the other hand, is related to system capacity to deliver ful spectrum of services to those who are within the reach of the system or the efficiency of the capacity of the system. To ensure universal access to health care, it is imperative that the health system is needs effective as well as capacity efficient.

A major issue in health system performance assessment in developing countries is the availability of appropriate data. In view of serious data limitations, WHO has recommended use of effective coverage rates in health system performance assessment (WHO, 2001). Effective coverage rate combines three aspects of health care - need, use and quality. WHO recommends that measurement of effective coverage should be routinely incorporated into assessment of the performance of the health system. Amjad (2008) has used coverage data to assess health system performance at the district level in Pakistan. Shankar and Kathuria (2004) have used an econometric model which is similar to WHO approach to analyse health system performance in 16 States of India. Recently, Purohit (2008, 2009, 2010) has carried out sub-State level analysis of health system performance and concluded that district health system performance determines State health system performance.

In this paper, we attempt to measure the performance of the district health system on the basis of coverage rates of selected maternal and child health interventions which may serve as a benchmark to assess up to what extent the National Rural Health Mission has contributed to improving district health system performance. The paper is organised as follows. The next section of the paper presents a brief overview of frameworks for health system performance assessment. The third section carries out an exploratory analysis of the coverage rate of selected health interventions across the districts of the country. The analysis reveals that coverage rates vary across the districts as well as within the districts. The fourth section of the paper analyses within-district variation in coverage rates of different health interventions which is an important dimension of health system performance. In the fifth section of the paper, a composite index of performance based on coverage rates of selected health interventions has been developed to measure district health system performance across the country. Finally, the sixth and the last section of the paper discusses the challenge of achieving universal access to health care through improving district health system performance.

Health System Performance Assessment

Genesis of the recent interest in health system performance assessment lies in the increased realisation among policy makers and development experts that strong health systems are essential to achieving and sustaining health gains (United Nations, 2005; World Bank, 2004; Travis et al, 2004). Experience the world over has indicated that vertical health programmes, community-based small scale projects and donor directed thematic health investments, etc. have not been effective enough in achieving the goal of universal access to health care and a more holistic approach is needed to meet the health needs of the people. Increased attention to health system performance has also been stimulated by the Millennium Development Goals. There is now a growing consensus that achieving and sustaining health related Millennium Development Goals is difficult if not impossible without improving the performance of the health system.

Concern about health system performance is however not new. Way back in the 1860s, Florence Nightingale pioneered systematic collection, analysis and dissemination of hospital data to understand and improve hospital performance. Subsequently, Codman emphasised the need for scrupulous collection and public release of surgical outcomes (Speigelhalter, 1999). However, it was only after 1990, that the vision of using large scale data source to measure and improve health system performance became a reality and the growing realisation of the need to improve health system performance has resulted in several performance assessment frameworks (OECD, 1998; AHCPR, 1999; Aday, et. al, 1998; Knowels, Leighton and Stinson, 1997; OECD, 1999; PAHO, 1999; Hoffimeyer and McCarthy 1994; Hsiao, 1995). Taken together, these frameworks provide rich source of ideas and approaches, although, a review of many of these frameworks by Murray and Frenk (2000) suggested that there is room for improvement.

There are two aspects of health system performance assessment. The first is defining the health system either in a narrow perspective or in a broad sense. In its narrowest perspective, health system may comprise of those activities which are directly under the control of the Ministry or the Department of Health. This definition may be further classified to include preventive, promotive and curative health care services or to confine to only curative services, etc. Another classification may be in terms of primary, secondary or tertiary care services. A third classification may distinguish between public health services from private health services. A broader conceptualisation of the health system, on the other hand, may include individual care and community health services but excludes inter-sectoral actions directed towards health improvement. Finally, in its broadest sense, health system may comprise of all actors, institutions and resources that influence health of the people, one way or the other. The World Health Organization follows this definition of the health system.

The second aspect of health system performance assessment is related to functions of the health system. Murray and Evans (2003) has grouped health system functions into four categories: 1) financing; 2) resource generation; 3) stewardship; and 4) service provision. Lóndono and Frenk (1997), on the other hand, have identified health system functions as: 1) financing; 2) services delivery; 3) modulation; and 4) articulation. Mills and others (2006) suggest that health system functions should include : 1) stewardship and regulation; 2) organisation; 3) financing; and 4) management. Common in all these descriptions are the financing function and the stewardship or the governance function.

Health system performance can be assessed in terms of outputs or outcomes of the health system. Outputs are production or delivery of health services. Outcomes are the impact of services on the health of the people. Traditionally, health of the people has been measured in terms of outcomes with expectation of life at birth as the universally preferred indicator. Although, the relationship between mortality and health system outputs is not direct, yet, WHO advocates the use of disability adjusted expectation of life at birth (DALE) to measure health. Estimation of DALE is however very data intensive.

Another approach to measure health outcomes focusses on adverse outcomes of health interventions (Zee and Or, 1999) such as:

- rates of avoidable mortality and morbidity.
- rates of effective health-care interventions which have an undisputed and important role in health gain.
- survival rates at a given point in time after an intervention or treatment.
- rates of adverse health events which can only be a result of health care interventions.

It is important to ensure while using adverse outcomes approach that adverse outcomes are relevant to key health issues and there is a clear understanding of the relationship between health care interventions and the health status of the people.

The WHO framework for health system performance assessment divides the performance assessment process into functions and the objectives of the health system and establishes the link between the two (WHO, 2000). Functions of the health system have been grouped into four categories: 1) stewardship; 2) investment; 3) financing; and 4) service delivery. The first three functions determine delivery of services which is an important determinant of the health of the people in addition to the responsiveness of the health system and fair distribution of the financial resources available. WHO has also defined building blocks of the health system in the context of both long-term and intermediate goals of the health system (WHO, 2007).

The World Bank, on the other hand, has developed a health system analysis framework which focusses on dissecting different parts of the health system for separate analysis (Bitran, et. al, 2010). This framework divides the health system into four components - financing, payments to services providers, organisation and services delivery, and regulation. It measures performance in terms of effectiveness and efficiency, equity, quality of care and financial protection. Another approach has been suggested by Roberts and others (Roberts et. al, 2003) which offers a systematic approach to performance improvement through five policy control knobs - financing, payment, organisation, regulation, and persuasion - that policymakers should modify, alone or in combination, to achieve the desired performance.

Operationalising any health system performance assessment framework requires a business model. Since, health system is a multi-dimensional entity, a composite approach is required. There are however advantages and disadvantages in using composite indicators (Saisana and Tarantola, 2002). Construction of composite indicators are much like development of mathematical or statistical models. Their appropriateness depends upon conceptual clarity and analytical ingenuity (Rosen, 1991). Different approaches have been used for constructing composite indicators of health system performance (Jcobs et. al, 2004; Court, 2006; Peter, 2006; Lozano and Boerma, 2006; Victora et. al, 2005; Cecilia Vidal et. al, 2006). The WHO approach, on the other hand, involves five outcome variables and four functions of the health system (WHO, 2000).

Methodology and Data Source

We have used coverage rate of 14 health interventions available through the District Level Household Survey (DLHS) 2007-08 to measure district health system performance. The list of health interventions along with the definition of the coverage rate is given in table 1. Selection of the interventions was dictated by the availability of information through DLHS 2007-08 which is the only source of information about the coverage of health interventions at the district level. DLHS covers services delivered through either public or private health system so that coverage rates reflect the performance of the health system as a whole.

The performance assessment exercise has been carried out in three parts. First, we use the exploratory data analysis tools to examine the distribution of coverage rates across the districts of the country. Essentially, we prepare kernel density plots of inter-district distribution of the coverage rate of different health interventions included in the analysis. Kernel density is a non-parametric approach of estimating the probability density function (Zucchini, 2003). The non-parametric approach of analysing the distribution pattern is advantageous as it does not require any assumption about the shape of the distribution.

Next, we analysis the variation in coverage rate of different health interventions within the same district. This variation is a reflection of differential performance of the health system in different dimensions of health care within the same district. The within district variation in coverage rates is measured through the inter-median difference (*IMD*) and the inter-individual difference (*IID*). *IMD* compares the coverage of different health interventions in the district with the average coverage of all health interventions. *IID*, on the other hand, compares the coverage of each health intervention in the district with the coverage of every other intervention rather than comparing it with the average coverage of all interventions (Gakidou et. al, 2003). Conventionally, arithmetic mean is used in the calculation of individual mean differences to estimate *IMD*. We however use median in place of arithmetic mean of the coverage rates of 14 health interventions within the same district. We do not use arithmetic mean in estimating within-district inequality in coverage of different health interventions because arithmetic mean is influenced by very low and very high coverage of one or two health interventions and hence reflects a distorted picture. This is not the case with median as it does not depend upon extreme values. In the extreme case when coverage rates of all health interventions is 100 per cent or very close to 100 percent, there is very little difference in *IMD* based on arithmetic mean or based on median. Similarly, when coverage rates are very low, there is no significant difference in *IMD* based on arithmetic mean or median. We use the individual median difference in purely relative sense and not in the absolute sense as we are interested in the relative performance of the district health system in one dimension of health care compared to other dimensions. Similarly, we use the special case of inter-individual difference when *IID* is equal to the Gini coefficient, a relative measure frequently used to reflect inequality in the distribution of income (Gini, 1912).

Finally, we develop a composite index of health system performance based on the coverage rates of 14 health interventions included in the analysis. We follow the approach suggested by OECD (2008) with some modifications. The approach essentially involves application of the factor analysis procedure to combine different health interventions into factors or domains of the health system while preserving the maximum possible variation in the original data set. Largest factor loadings are assigned to those health interventions which have the largest variation in coverage the districts, a desirable property for inter-district comparison. The factor loadings generated through factor analysis are then used first to construct the domain specific performance index and then combining domain-specific performance indexes into district health system performance index. The approach suggested by Nicoletti and others (2000) was followed. Domain-specific performance index was calculated as the weighted sum of effective coverage rate of health interventions with highest factor loadings in the domain with weights constructed from the matrix of factor loadings given that the square of factor loadings represented the proportion of the total unit variance of the variable which is explained by the factor or the domain. The domain-specific performance indexes so obtained were then aggregated geometrically by assigning weights to each one of them equal to the proportion of the explained variation. Geometric aggregation was used as an undesirable feature of additive aggregation is the implied full compensability so that poor coverage in some interventions can be compensated for by sufficiently high coverage in other interventions.

The performance assessment exercise is based on district level coverage rate of the 14 health interventions given in table 1 available through the DLHS 2007-08. DLHS provides estimates of coverage rates of selected health interventions for total and rural populations for 601 districts from 34 States and Unition Territories of the country as they existed circa 2007-08. DLHS was not carried out in the State of Nagaland. DLHS 2007-08 covered 720,320 households in which 643,944 ever married women in the age group 15-49 years were surveyed. Coverage rates of the 14 health interventions included in the present assessment exercise are however available for 600 districts. Coverage rates are not available for all the 11 districts of Nagaland as DLHS 2007-08 was not conducted in the State. Coverage rates are also not available for district Mahe in the Union Territory of Pondicherry. In case of rural areas, on the other hand, coverage rates are available for only 592 districts as in 8 districts, there was no rural population at the time of DLHS 2007-08.

Details regarding the organisation of DLHS 2007-08 including the sample size in each district, method of sample selection, questionnaire used and interviewing procedure, coverage, limitations of the survey, etc. are given elsewhere (IIPS, 2010) and are not repeated here. In each district, around 1000-1100 households were selected and surveyed under DLHS from both rural as well as urban areas of the district. However, estimates of coverage rates are confined to total and rural populations only as estimation of coverage rates in the urban areas was not possible because of very small size of the urban sample.

Results

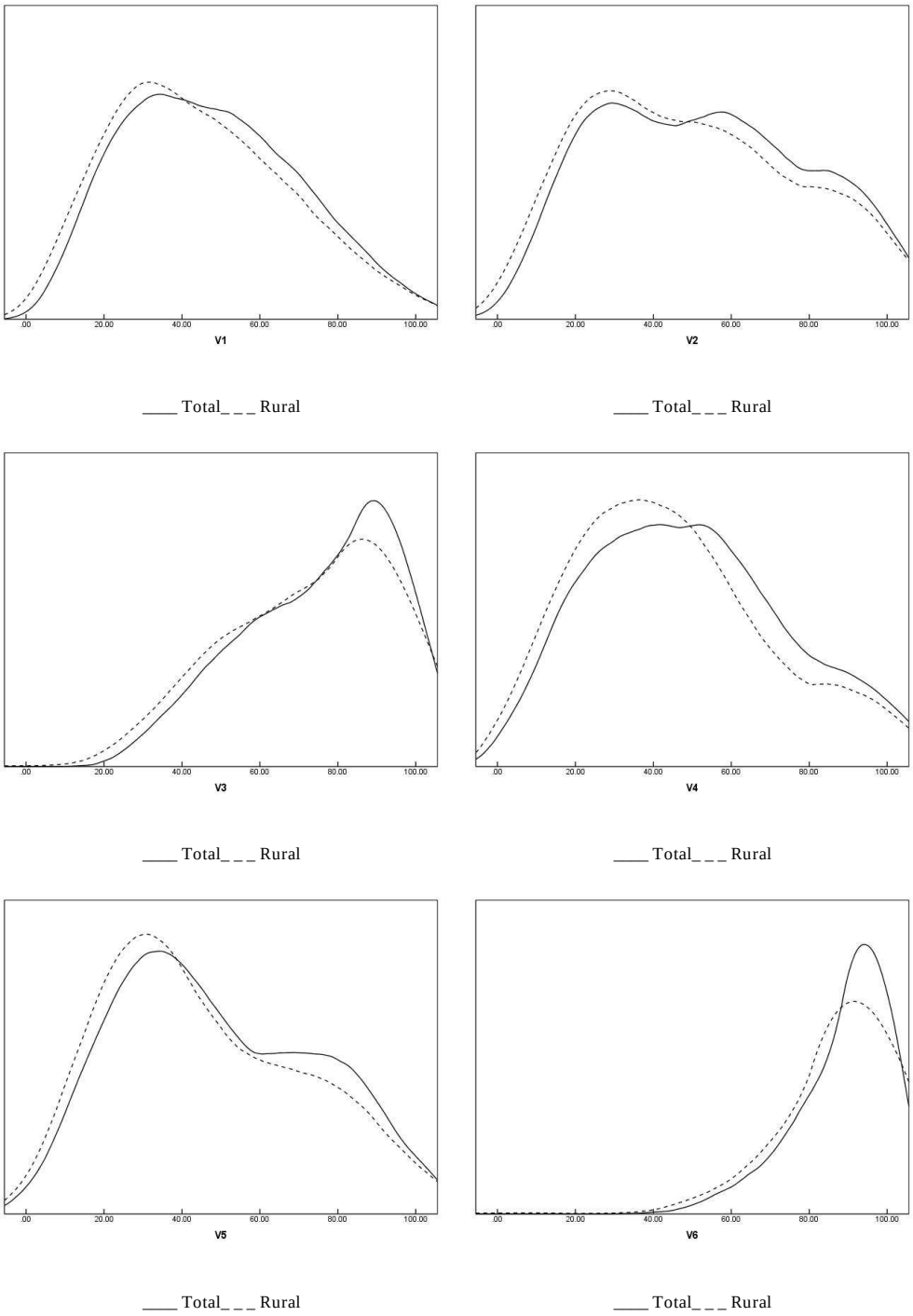
a. Inter-district Distribution of Coverage Rates. The kernel-density plots of the inter-district distribution of the coverage rates of different health interventions are presented in figure 1 while summary measures of the inter-district variation in coverage rates are presented in table 2 from which at least three observations can be made. First, coverage rates vary widely across the districts of the country. Second, the inter-district variation in the coverage rate is different for different health interventions and in most of the health interventions, this distribution is skewed. In child immunisation related interventions, the distribution is negatively skewed whereas in all but one maternal health related interventions the distribution is positively skewed. In case of child health related interventions, inter-district distribution of the proportion of new born initiated breastfeeding within one hour of birth is almost normally distributed while the distribution of the proportion of new born exclusively breastfed during the first six months is positively skewed.

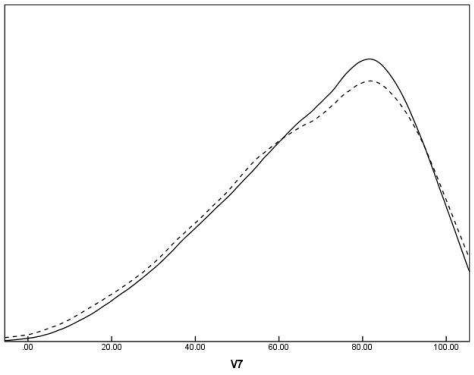
Third, there is only a marginal difference in the inter-district distribution of coverage rates in the total population as compared to the rural population, although coverage rates in the rural population is in general lower than the coverage rates in the total population. The almost similarity in the coverage rates in the total population and in the rural population suggests that the district health system performance depends heavily on the performance of the health system in the rural areas.

The performance of the district health system can be classified ranging from very poor to very good on the basis of the level of coverage. If the coverage level is less than 20 per cent, the performance may be classified as very poor. When the coverage level varies between 20-40 percent, the performance may be classified as poor and average when the coverage level varies between 40-60 per cent. The performance may be classified as good when the coverage level varies between 60-80 per cent and very good when the coverage is at least 80 per cent. According to this classification, there was not a single district where the health system performance in BCG vaccination (V6) was either poor or very poor in the total population (Table 3). Similarly, there was no district where the performance was very poor in terms of tetanus toxoid to pregnant women (V3). By comparison, the performance was very poor in 218 districts in terms of the proportion of children exclusively breastfed during the first six months (V14).

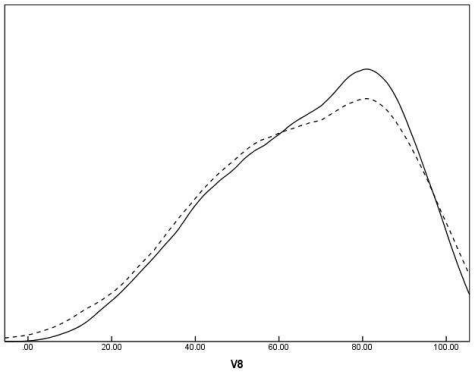
The situation in the rural population is very much similar to that in the total population. District health system performance appears relatively to be the best in BCG vaccination to children and tetanus toxoid to pregnant women but the poorest in case of exclusive breastfeeding to children during the first six months of life. In any case, the fact that the performance of the district health system varies by the health intervention implies that district health system performance assessment cannot be based only one health intervention only. Rather, a multi-dimensional approach is required to assess the performance of the health system.

Figure 1
Kernel density plots of inter-district distribution of coverage rate of different public health interventions

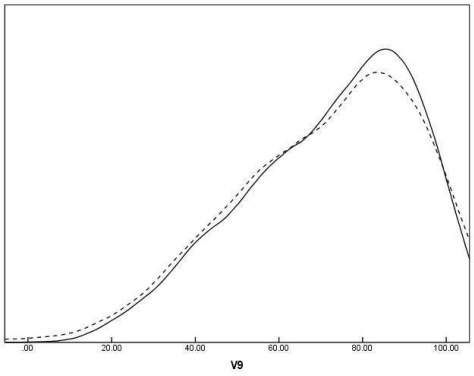




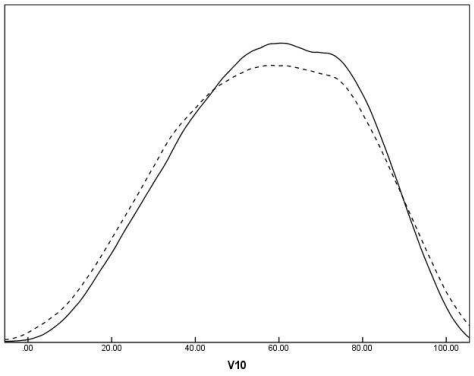
____ Total_ _ _ Rural



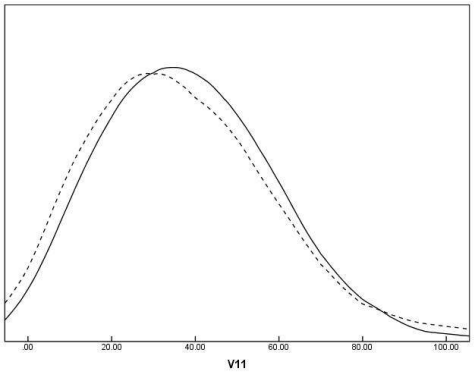
____ Total_ _ _ Rural



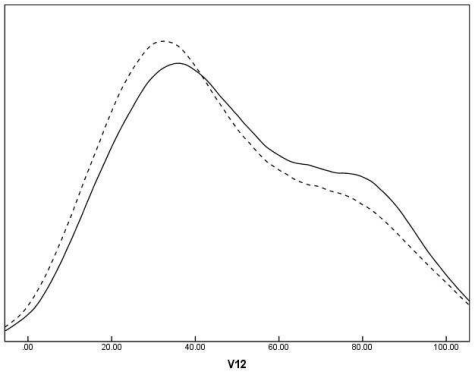
____ Total_ _ _ Rural



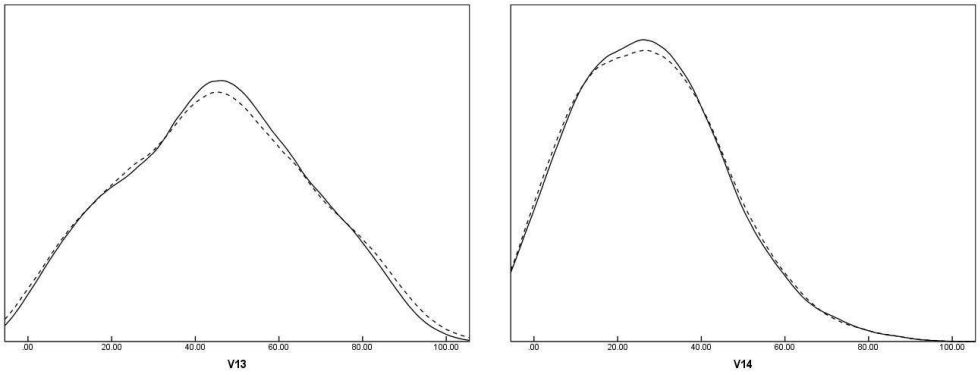
____ Total_ _ _ Rural



____ Total_ _ _ Rural



____ Total_ _ _ Rural

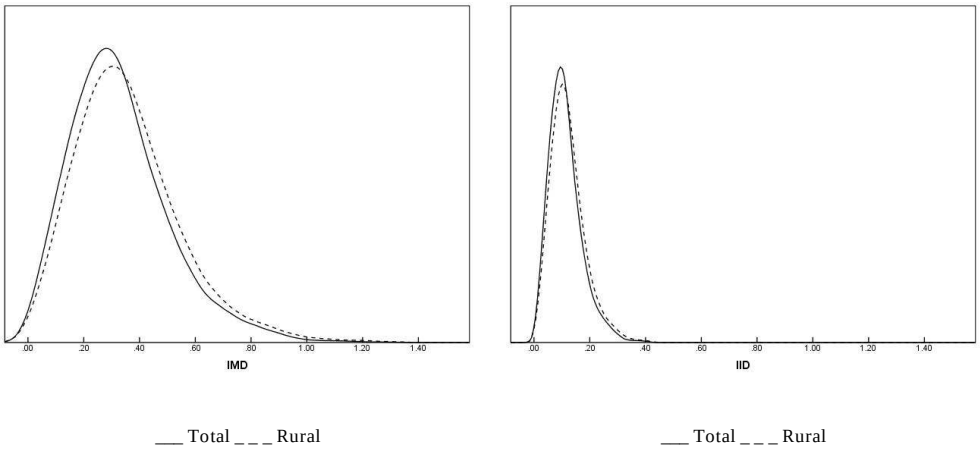


____ Total_ _ _ Rural ____ Total_ _ _ Rural

b. Within-district Performance Inequality. Summary measures of the inter-district variation in the two indexes of within-district performance inequality, *IMD* and *IID* for total and rural populations are given in table 4 while the kernel density plots of the inter-district variation in the indexes of inequality are presented in figure 2. In the calculation of *IMD* and *IID*, it was assumed that α=1 and β=1 which gives equal weight all interventions within the district. Inter-district variation in both *IMD* and *IID* is positively skewed which suggests that in some districts of the country, within-district variation or inequality in the coverage of different health interventions is very high. The highest within-district inequality in coverage rates is estimated in district Siddarthnagar of Uttar Pradesh for the total population and in district Ghazipur also of Uttar Pradesh for the rural population. In district Siddarthnagar, coverage rates vary from more than 75 per cent in case of tetanus toxoid vaccination to pregnant women to just around 6 per cent in case of exclusive breastfeeding during first six months of life. In the rural areas of district Ghazipur, on the other hand, coverage rates vary from more than 80 per cent in case of tetanus toxoid vaccination to less than 14 per cent in case ORS to children with diarrhoea. Out of 10 districts where within-district inequality in coverage is found to be amongst the highest in the country, six are in Uttar Pradesh in the total as well as rural population . The district North Delhi in the National Capital Territory of Delhi coverage of all interventions related to child immunisation is found to be zero according to DLHS 2007-08. As such, within-district inequality in coverage of different health interventions is estimated to be very high in this district.

By comparison, the within-district variation or inequality in the coverage inequality is found to be the least in district Baramula of Jammu and Kashmir for the total population and in district Nicobar of Andaman and Nicobar Islands for the rural population. In district Baramula, coverage of all interventions is found to be more than 50 per cent whereas in Nicobar, coverage is found to be more than 50 per cent in all but one interventions.

Figure 2
Kernel density plots of inter-district distribution in the within-district inequality in coverage rates.



c. Composite Index of Performance. Application of the factor analysis procedure to inter-district variation in the coverage of 14 health interventions suggests that the 14 interventions can be grouped into three factors or domains of the health system which account for more than 82 per cent of the total variance in the original data set in the total population and 81 per cent of the variance in the rural population. The Kaiser-Meyer-Olkin (K-M-O) measure of sampling adequacy which reflects the homogeneity of variables, was 0.914 in the combined population and 0.911 in the rural population which means that the partial correlations among the variables are small and patterns of correlations are relatively compact. This indicates that factor analysis procedure has yielded distinct and reliable factors (Sharma, 1996). The Bartlett's test of sphericity was also found to be statistically significant in both total (approximate χ^2=113036.847, df=91, p=0.000) and rural (approximate χ^2=10636.353, df=91, p=0.000) populations which means that the correlation matrix used in the analysis was not the identity matrix. Both these tests confirmed that factor analysis was the appropriate procedure for summarising the data set used in the present analysis.

The first of the three domains of the health system revealed through factor analysis has high loadings in six variables, all of which are related to maternal health and account for around 34 per cent of the total variation in both total and rural populations. This domain, therefore, can be termed as the maternal health domain of the health system. The second domain also accounts for almost 34 per cent of the total variance in both total and rural populations and has high loadings in interventions related to child immunisation. This domain, therefore can be termed as the immunisation domain of the health system. Finally, the third domain accounts for around 14 per cent of the total variance and has high loadings child health related interventions. This domain, can be termed as the

child health domain os the health system. Specific health interventions having high loadings in the three domains along with the proportion of the total variance accounted by each domain is given in table 5. In every domain, interventions having a loading of at least 0.60 are shown. It is also clear from the table that the domain structure is the same for the combined and the rural population. The factor analysis procedure thus suggests that the district health system performance can be measured in terms of the performance in maternal health domain, child immunisation domain and child health domain with only a marginal loss in inter-district variability. We have therefore estimated the performance index separately for three domains and then combined them to obtain the health system performance index for each of the 600 districts of the country. According to this exercise, the district health system performance has been found to be the best in the country in district Thiruvananthapuram of Kerala for the total population with an index of 84.31 out of a maximum of 100. By comparison, in district Bahraich of Uttar Pradesh, the district health system performance may be termed as the poorest in the country. The composite index of performance in the district is only 16.66 which is the lowest in the country.

Among the three domains of the district health system, performance in the domain of maternal health is found to be the best in district Pathanamthitta of Kerala (99.13) but the poorest in district Baharaich of Uttar Pradesh (13.65). In the domain of child immunisation, on the other hand, performance is found to be the best in district Hamirpur of Himachal Pradesh (97.08) but the poorest in district Mewat of Haryana (21.25). Finally, in the domain of child health, performance is found to be the best in district Nicobars of Andaman and Nicobar Islands (68.88) but the poorest in district Muzaffarnagar of Uttar Pradesh (3.69).

In the rural population, district health system performance is found to be the best in district Pathanamthitta of Kerala with an index of 85.75 whereas the index is estimated to be zero in district North Delhi of the National Capital Territory of Delhi. In North Delhi, child immunisation coverage is reported to be zero in the rural areas according to DLHS 2007-08 so that the performance index is zero. In the maternal health domain, the performance of the district health system in the rural areas is found to be the best in district Alappuzha of Kerala (94.4) but the poorest in district Balia of Uttar Pradesh (7.87). In child immunisation domain, the best and the poorest performing districts in the rural areas are district Thiruvarrur of Tamilnadu (98.08) and district North Delhi of the National Capital Territory of Delhi (0.0) respectively. Finally, in the child health domain, the best and the poorest performing districts are Nicobars in Andaman and Nicobar Islands (78.19) and district Basti of Uttar Pradesh (3.27) respectively.

Summary measures of the inter-district variation in the composite performance index are given in table 6 while the kernel density plots are presented in figure 3. For the total population, the kernel density plot for the overall performance index is very close to a normal platokurtic curve but positively skewed in the rural population. In maternal health and child health domains, the skewness is positive but negative in the child immunisation domain.

Figure 3
Kernel density plots of districts health system performance index

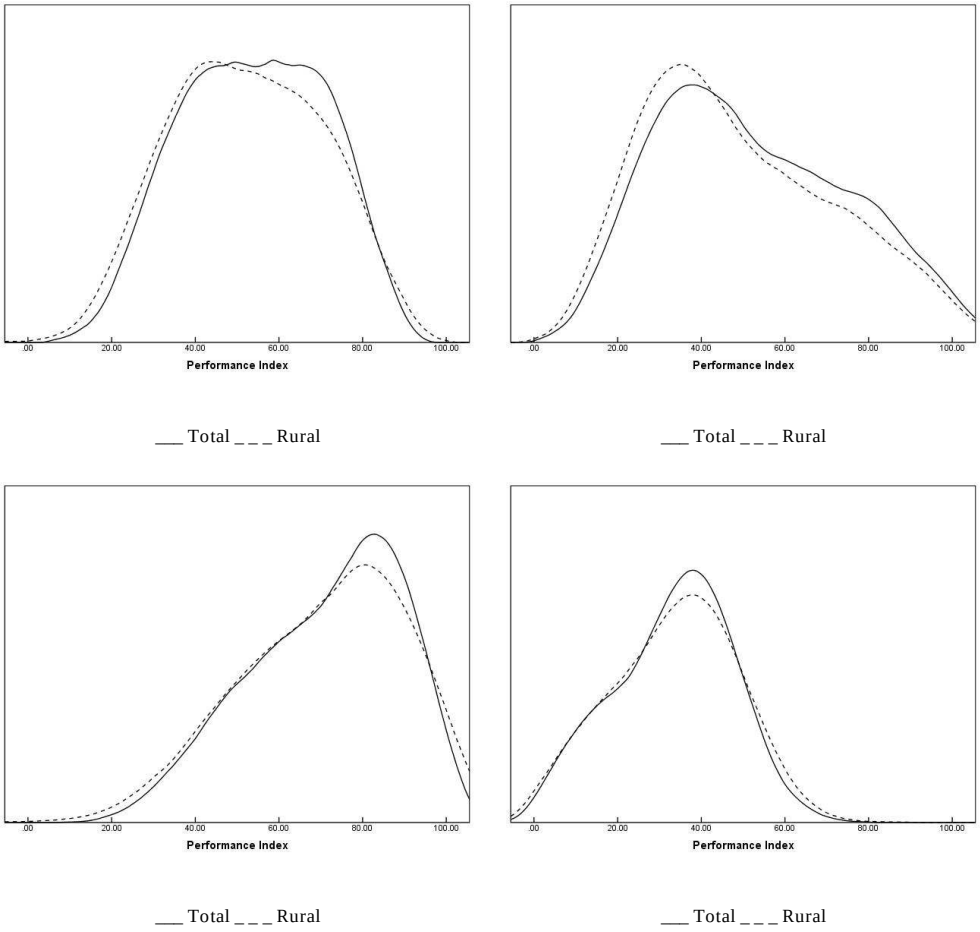
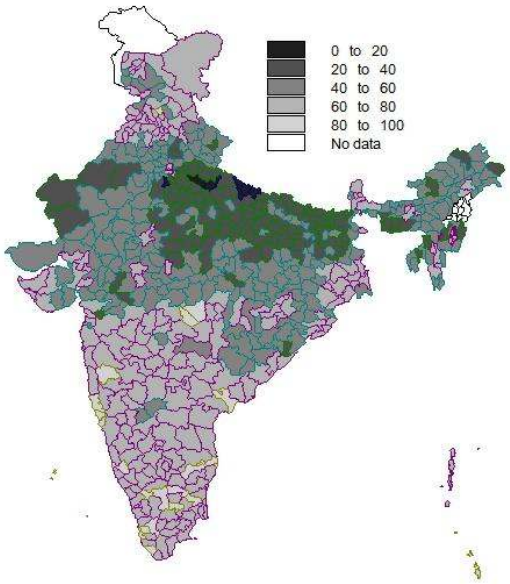


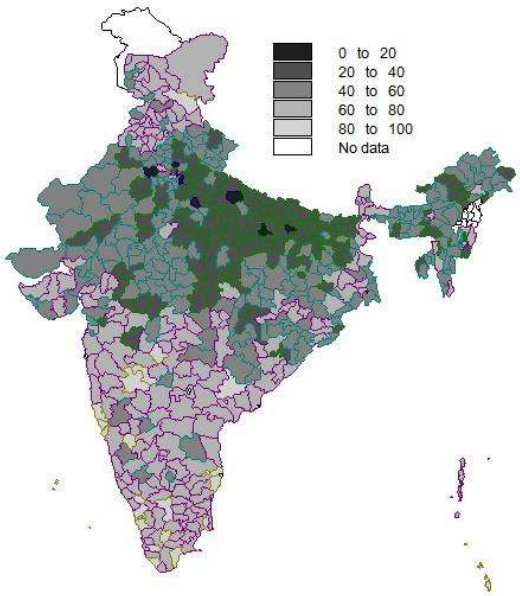
Figure 4 depicts the geographical pattern of inter-district variation in the district health system performance index for total and rural populations. The performance of the district health system has been found to be good and very good in 245 or around 40 per cent districts of the country in case of total population and around 36 per cent in case of rural population (Table 7). On the other hand, performance has been found to be poor or very poor in 138 or 23 per cent districts in case of total population but in 165 or around 28 per cent districts in case of rural population. There are only 23 districts in the country where the performance has been found to be very good in both total and rural populations with the performance index of at least 80 out of a maximum of 100. On the other hand, the performance has been found to be very poor in 6 districts in the total population and 8 districts in the rural population with the performance index of less than 20. The only district in the country with a zero performance index in the rural areas is the district North Delhi in the National Capital Territory of Delhi.

Figure 4
Inter-district variation in the district health system performance index

Total population



Rural population



The distribution of districts by district health system performance in the three domains of the health system is also given in table 7. The district health system performance appears to be the poorest in the child health domain but the best in the child immunisation domain. In the child health domain, there is no district in the country where the district health system performance was very good in the total or in the rural population. By contrast, the performance in the child immunisation domain was very good in 238 districts in the total population and in 231 districts in the rural population. There is no district in the country where the performance in the child immunisation domain is very poor in the total population. However, in the rural population, there are three districts in the country where the performance in the child immunisation domain is found to be very poor. These districts are North Delhi and North West districts in the National Capital Territory of Delhi and district Kurung Kumay of Arunanchal Pradesh. In case of maternal health domain also, the situation is not very satisfactory as there are only 90 (15 per cent) districts in the total population and 73 (12 per cent) districts in the rural population where the performance is found to be very good.

The north south divide in the district health system performance is also very much evident from figure 4. Throughout the northern part of the country, the performance of the district health system remains unsatisfactory with the district health system performance index being less than60 in most of the districts in total as well as rural populations. By comparison, the district health system performance in the southern part of the country can generally be termed as satisfactory with most of the districts having a performance index of at least 60 in total as well as in rural populations. In fact, all the ten best performing districts in the country are located in the southern part of the country whereas all the ten poorest performing districts are located in the northern part in both total and rural populations (Table 8).

The districts in India are organised into States and Union Territories for political and administrative purposes. It is therefore logical to carry out a State/UT specific assessment of district health system performance. The State/UT wise distribution of districts by the level of performance is given in table 9. In case total population, the performance of the district health system is found to be good or very good in all districts of Andaman and Nicobar Islands, Daman and Diu, Goa, Kerala, Lakshadweep, Puducherry and Tamil Nadu. By comparison, there is not a single district in Arunachal Pradesh, Bihar, Dadra and Nagar Haveli, Meghalaya, Tripura and Uttar Pradesh where the district health system performance is found to good or very good. In the rural population, on the other hand, there is not a single district in Arunachal Pradesh, Bihar, Dadra and Nagar Haveli, Jharkhand, Meghalaya, Rajasthan, Tripura, Uttar Pradesh and Uttarakhand where the district health system performance index is found to be good or very good. In the remaining States and Union Territories, the performance of the district health system varies widely across the districts with good or very good district health system performance in some districts associated with poor or very poor performance in other districts.

Discussions and Conclusions

The district health system is directed towards meeting the health needs of the people through improving the coverage of selected health interventions with the ultimate goal of achieving universal coverage. The present analysis suggests that there exist significant inter-district variation in the performance of the district health system in terms of coverage of key maternal and child health interventions. It is also evident from the analysis that there are only a handful of districts in the country where it is possible to achieve the goal of universal coverage of maternal and child health interventions in the near future. The analysis also suggests that, in general, there is ample scope for improving the district health system performance through increasing the coverage of key maternal and child health interventions to meet the health needs of the people. In this context, health system performance index, estimated and presented for each of the 600 districts of the country in this paper may serve as the benchmark for the National Rural Health Mission for measuring and monitoring district health system performance in terms of meeting the health needs of the people.

The analysis also reveals that the coverage of health interventions varies not only across the districts but also with districts. These variations in the coverage of health interventions may be the result of a host of factors endogenous as well as exogenous to the district health system. The exogenous factors are related to the social, cultural and economic context of health and health care and are generally beyond the scope of the district health system. The endogenous factors, on the other hand, are related to the administrative capacity and organisational efficiency of the district health system. The importance of the administrative capacity and organisational efficiency of the district health system in meeting the health needs of the people lies in the fact that both administrative capacity and organisation efficiency are subject to managerial control. However, very little is currently known about the administrative capacity and organisational efficiency of the health care delivery system at the district level in India. The National Rural Health Mission has focussed on a decentralised, district-based approach of planning for health care services but there has been little effort towards measuring and monitoring the administrative capacity and organisational efficiency of the district health system and how it impacts upon the delivery of health care. An analysis of the administrative capacity and organisational efficiency of the health care delivery system at the district level may go a long way in improving the performance of the district health system as the delivery of key maternal and child health services is planned, implemented and monitored only at the district level. The analysis of the administrative capacity and organisational efficiency of the district health system is also needed in view of the observation that there appears a clear north-south divide in the performance of the district health system. In the north Indian States of Bihar, Jharkhand, Rajasthan, Uttar Pradesh and Uttarakhand, there is not a single district where the performance of the district health system is found to be good or very good. In Madhya Pradesh also, there are only 2 districts where the performance of the district health system

has been found to be good. In all these States, except Uttarakhand, the health attainment indicators are far also from satisfactory which means that district health system performance does have an impact on the health of the people.

Moreover, differential performance of the district health system in the domains of maternal health, child immunisation and child health suggests that the district health system lacks a comprehensive, integrated approach of delivering health care services to meet the health needs of the people. It is worth pointing out here that the basic orientation of health interventions related to maternal health, child immunisation and child health is essentially different. Maternal health services are primarily clinic-based whereas child immunisation services are essentially community-based. Child health related interventions, particularly promotion of breastfeeding, on the other hand, are influenced by behaviour change communication interventions. As such, the differential performance of the district health system may be investigated in terms of its capacity in organising clinic-based services, community-based interventions and behaviour change efforts.

The differential performance of the district health system in the domains of maternal health, child immunisation and child health may also be traced in the history of planned efforts in the form of national programmes in the three domains. Planned efforts in the child immunisation in India are the oldest. They started with the launch of Expanded Programme of Immunisation in 1978 followed by Universal Immunisation Programme in 1985, Child Survival and Safe Motherhood Programme in 1992 and Reproductive and Child Health Programme in 1997. By comparison, planned efforts in the maternal health were introduced only in 1992 with the launch of Child Survival and Safe Motherhood Programme and got a boost under the Reproductive and Child Health Programme. Finally, planned efforts to promote such child health interventions as breastfeeding through behaviour change communication are the most recent. Relatively better performance of the district health system in child immunisation domain appears to be related to a long history of planned efforts directed towards universal child immunisation. It appears that the performance of the district health system is driven more by the strength and duration of the planned efforts conceived at the national level and imposed upon the district health system for implementation than by factors or conditions specific to the district. In fact, although the National Rural Health Mission strives for decentralised district-based planning for health services delivery, yet most of this decentralised planning is in the context of a range of national health programmes that are conceived and designed at the national level. There is very limited 'local' or 'district specific' in the decentralised district-based planning for health services delivery.

Last but not the least, the composite performance index estimated for the district health system of each district of the country may serve as a benchmark to measure and monitor improvements in district health system performance in meeting the health needs of the people through increasing coverage of key health interventions even if they are conceived at the top.

References

Aday LA, Begley CE, Lairson DR, Slater CH (1998) *Evaluating the Medical Care System: Effectiveness, Efficiency, and Equity*. Chicago, Health Administration Press.

AHCPR (1999) Quality measurement initiatives in the US Federal Government. Presentation at Commonwealth Fund, March 1999.

Amjad S (2008) Health system performance measurement in a developing country: Sharing Pakistan's experience, challenge and policy implications. Asia Pacific COP-MFDR.

Bitran R, Gómez P, Escobar L, Berman P (2010) *Review of World Bank Experience with Country Level Health System Analysis*. Washington DC, The World Bank.

Cecilia V, Lozano R, Murray JL (2006) *Effective Coverage of the Health System in Mexico 2000-2003*. Health Information Department, Ministry of Health, Mexico; the National Institute of Public Health, Mexico; and the Harvard Initiative for Global Health (HIGH), Harvard University, USA.

Chaurasia AR(2009) Mortality transition in India: 1970-2005. *Asian Population Studies*, 6(1):47-68.

Court J (2006) Governance, development and aid effectiveness: A quick guide to complex relationships. Overseas Development Institute.

Gakidou E, Murray CJL, Frenk J (2003) A framework for measuring health inequality. In CJL Murray and DB Evans (editors) *Health Systems Performance Assessment. Debates, Methods and Empiricism*. Geneva, World Health Organization.

Gini C (1912) *Variabilita e mutabilita*. Bologna, Tripogr. di P. Cuppini.

Government of India (2005) *National Rural Health Mission*. New Delhi, Ministry of Health and Family Welfare.

Government of India (2012) *Millennium Development Goals. India Country Report 2011*. New Delhi, Government of India, Ministry of Statistics and Programme Implementation.

Hoffmeyer UD, McCarthy TR (1994) *Financing Health Care*. Volume I. Kluwer Academic Publishers.

Hsiao CW (1995) A framework for assessing health financing strategies and the role of health insurance. In D Dunlop and J Martins (1995) *An International assessment of health care financing. Lessons for developing countries*. The World Bank.

International Institute for Population Sciences (2010) *District Level Household and Facility Survey 2007-08. Key Indicators: India, States, Union Territories and Districts*. Mumbai, International Institute for Population Sciences.

Jacobs R, Smith P, Goddard M (2004) Measuring performance: An examination of composite performance indicators, *CHE Technical Paper Series 29*. York, University of York. Center for Health Economics.

Knowles JC, Leighton C, Stinson W (1997) Measuring results of health sector reform: A handbook of indicators. Bethesda, Maryland, Partnerships for Health Reform. Special Initiatives Report No. 1.

Londono JL, Frenk J (1997) Structured Pluralism: towards an innovative model for health system reform in Latin America. *Health Policy* 41:1-36.

Lozano R, Boerma T (2006) Co-coverage of interventions: A useful index to monitor health systems performance? www.healthmetricsnetwork.org.

Mills A, Rasheed F, Tollman S (2006) Strengthening Health Systems. In D Jamison, JG Breman, AR Measham, G Alleyne, M Claeson, DB Evans, P Jha P, A Mills, P Musgrove (editors) *Disease Control Priorities in Developing Countries*. 87-102. Oxford, Oxford University Press.

Murray CJL, Frenk J (2000) A framework for assessing the performance of health systems. *Bulletin of World Health Organization* 78(6): 717-731.

Murray CJL, Evans DB (2003) *Health Systems Performance Assessment. Debates, Methods and Empiricism*. Geneva, World Health Organization.

Nicoletti G, Scarpetta S, Boylaud O (2000), Summary indicators of product market regulation with an extension to employment protection legislation, *OECD, Economics Department Working Paper* No. 226.

OECD (1998) Health outcome measurement in OECD countries: toward outcome-oriented policy making. Paris, OECD. DEELSA/ELSA/WP1(98)6/ANN.

OECD (1999) An Assessment of Health System Performance across OECD Countries. OECD DEELSA/ELSA/WPI(99)3.

OECD (2008) *Handbook of Constructing Composite Indicators. Methodology and User Guide*. OECD.

Pan American Health Organization (1999) Guidelines for the preparation of the health services system profile in the countries of the region. Washington DC: Pan American Health Organization.

Peters D (2006) Measuring and managing health services: The balanced score card. www.healthmetricsnetwork.org.

Purohit BC (2008) Efficiency of the health care system: A sub-state level analysis for West Bengal (India). *Review of Urban and Regional Development Studies* 20(3): 212-25.

Purohit BC (2009) Efficiency of the health care at sub-state level in India: A case of Punjab. *Online Journal of Health and Allied Sciences* 8(3).

Purohit BC (2010) Efficiency of the health care at sub-state level in Madhya Pradesh (India). *Social Work in Public Health* 85: 42-58.

Roberts MJ, Hsiao WC, Berman P, Reich MR (2003) *Getting Health Reform Right*. New York, Oxford University Press.

Rosen R (1991) *Life Itself: A Comprehensive Inquiry into Nature, Origin, and Fabrication of Life*. Columbia University Press.

Saisana M, Tarantola S (2002) State-of-the-art report on current methodologies and practices for composite indicator development. European Commission.

Shankar D, Kathuria VK (2004) Health system performance in rural India. Efficiency estimates across States. *Economic and Political Weekly* 39(13): 1427-33.

Sharma (1996) *Applied Multivariate Techniques*. New York, John Wiley and Sons. 493 pp.

Speigelhalter D (1999) Surgical audit: Statistical lessons from Nightingale and Codman. *Journal of Royal Statistical Society*, 162:45-58.

Travis P, Bennett S, Haines A, Pang T, Bhutta Z, Hyder AA, et. al (2004) Overcoming health-systems constraints to achieve the Millennium Development Goals. *The Lancet*, 364:900–6.

United Nations (2004) *World Population Prospects: The 2004 Revision. Volume III: Analytical Report*. New York, United Nations.

United Nations (2005) Who's got the power? Transforming health systems for women and children. Task Force on Child Health and Maternal Health. New York: UN Millennium Project.

Victora CG, Fenn B, Bryce J, Kirkwood BR (2005) Co-coverage of preventive interventions and implications for child survival strategies: evidence from national surveys. *Lancet*, 366:1460-66.

World Bank (2004) High-level forum on the health MDGs. Summary of discussion and action points. Abuja, Nigeria, World Bank.

World Health Organization (2000) *World Health Report 2000. Health Systems: Improving Performance*. Geneva, World Health Organization.

World Health Organization (2001) *Health Systems Performance Assessment. Report by the Secretariat*. Geneva, World Health Organization.

World Health Organization (2007) *Everybody's Business: Strengthening Health Systems to Improve Health Outcomes*. Geneva, World Health Organization.

Jee M, Or Z (1999) Health Outcomes in OECD Countries: A Framework of Health Indicators for Outcome-Oriented Policymaking. *OECD Labour Market and Social Policy Occasional Papers*, No. 36

Zucchini (2003) Applied smoothing techniques. Part I: Kernel density estimation. http://isc.temple.edu/economics/econ616/kernel/ast_part1.pdf.

Table 1
Indicators used in the analysis

V1	Proportion of women registered in the first trimester when they were pregnant with last live birth/still birth (%)
V2	Proportion of women who had at least 3 Ante-Natal care visits during their last pregnancy (%)
V3	Proportion of women who received at least one TT injection when they were pregnant with their last live birth / still birth (%)
V4	Proportion of institutional births out of total births (%)
V5	Proportion of women who received postnatal care within 48 hours after delivery (%)
V6	Proportion of children (12-23 months) who have received BCG (%)
V7	Proportion of children (12-23 months) who have received 3 doses of Polio Vaccine (%)
V8	Proportion of children (12-23 months) who have received 3 doses of DPT Vaccine (%)
V9	Proportion of children (12-23 months) who have received Measles Vaccine (%)
V10	Proportion of children (9-35 months) who have received at least one dose of Vitamin A (%)
V11	Proportion of children with diarrhoea in the last two weeks who were given ORS (%)
V12	Proportion of children who had a check-up within 24 hours after delivery (based on last live birth) (%)
V13	Proportion of children breastfed within one hour of birth (%)
V14	Proportion of children (age 6 months above) exclusively breastfed (%)

Source: IIPS (2010)

Table 2
Summary measures of inter-district distribution of coverage rate of different health interventions in India.

Variable		Minimum	Q1	Median	Q3	Maximum	IQR	N
				Total population				
V1	Women registered in the first trimester when they were pregnant with last live/still birth	10.10	29.63	46.05	63.58	97.60	33.95	600
V2	Women who had at least 3 Ante-Natal care visits during their last pregnancy	7.60	29.83	52.45	73.35	99.70	43.43	600
V3	Women who received at least one Tetanus Toxoid injection when they were pregnant with their last live/still birth	24.00	60.70	79.75	92.28	100.00	76.00	600
V4	Births delivered at an institution out of total births reported	5.90	29.43	48.00	65.80	100.00	36.38	600
V5	Women who received postnatal care within 48 hours after the delivery	5.80	29.00	44.90	71.38	100.00	42.38	600
V6	Children aged 12-23 months who have received BCG vaccination	40.90	82.70	92.75	97.80	100.00	59.10	600
V7	Children aged 12-23 months who have received 3 doses of Polio Vaccine (%)	5.00	53.93	72.85	86.58	100.00	32.65	600

Variable		Minimum	Q1	Median	Q3	Maximum	IQR	N
V8	Children aged 12-23 months who have received 3 doses of DPT Vaccine	14.00	52.23	70.55	84.30	100.00	32.07	600
V9	Children aged 12-23 months who have received Measles Vaccine	14.10	59.28	76.50	88.88	100.00	29.60	600
V10	Children aged 9-35 months who have received at least one dose of Vitamin A	7.80	43.93	59.25	74.10	94.60	30.17	600
V11	Children with diarrhoea in the last two weeks who were given ORS	0.00	23.50	37.50	50.00	100.00	26.50	600
V12	Children who had a check-up within 24 hours after delivery (based on last live birth)	4.00	30.30	46.10	71.80	100.00	41.50	600
V13	Children who were initiated breastfeeding within one hour of the birth	4.10	29.40	45.35	58.40	91.70	29.00	600
V14	Children aged 6 months above who were exclusively breastfed during the first six months of life	0.20	13.63	26.55	37.08	84.50	23.45	600

Variable		Minimum	Q1	Median	Q3	Maximum	IQR	N
				Rural population				
V1	Women registered in the first trimester when they were pregnant with last live/still birth	7.90	26.63	41.80	60.55	98.00	33.92	592
V2	Women who had at least 3 Ante-Natal care visits during their last pregnancy	4.80	27.05	48.20	69.03	100.00	41.97	592
V3	Women who received at least one Tetanus Toxoid injection when they were pregnant with their last live/still birth	20.00	57.58	77.05	91.18	100.00	33.60	592
V4	Births delivered at an institution out of total births reported	4.20	26.30	41.85	60.10	100.00	33.80	592
V5	Women who received postnatal care within 48 hours after the delivery	4.50	26.15	40.65	65.38	100.00	39.22	592
V6	Children aged 12-23 months who have received BCG vaccination	0.00	81.65	92.60	97.88	100.00	16.23	592
V7	Children aged 12-23 months who have received 3 doses of Polio Vaccine (%)	0.00	52.23	70.85	87.15	100.00	34.93	592

Variable		Minimum	Q1	Median	Q3	Maximum	IQR	N
V8	Children aged 12-23 months who have received 3 doses of DPT Vaccine	0.00	50.00	68.45	84.28	100.00	34.28	592
V9	Children aged 12-23 months who have received Measles Vaccine	0.00	57.13	74.80	89.68	100.00	32.55	592
V10	Children aged 9-35 months who have received at least one dose of Vitamin A	0.00	41.28	57.85	73.70	94.70	32.45	592
V11	Children with diarrhoea in the last two weeks who were given ORS	0.00	20.33	34.80	50.00	100.00	29.68	592
V12	Children who had a check-up within 24 hours after delivery (based on last live birth)	3.80	27.80	41.50	66.48	100.00	38.67	592
V13	Children who were initiated breastfeeding within one hour of the birth	3.50	28.48	45.20	59.23	92.50	30.75	592
V14	Children aged 6 months above who were exclusively breastfed during the first six months of life	0.00	12.80	27.10	38.15	83.40	25.35	592

Source: Authors calculations

Table 3
Distribution of districts by the level of coverage in different health interventions

Health intervention		Very poor	Poor	Average	Good	Very good	Total
			Total Population				
V1	Registration of pregnant mothers in first trimester	47	187	185	128	53	600
V2	Three antenatal care visits	56	157	140	122	125	600
V3	At least 1 tetanus toxoid injection	0	32	114	160	294	600
V4	Institutional delivery	71	151	181	109	88	600
V5	Post natal visit within 48 hours	61	195	134	127	83	600
V6	BCG Vaccination	0	0	17	105	478	600
V7	OPV3 vaccination	9	59	120	195	217	600
V8	DPT3 vaccination	6	67	136	195	196	600
V9	Measles vaccination	1	44	109	183	263	600
V10	Vitamin A prophylaxis	13	109	188	194	96	600
V11	Given ORS during diarrhoea	113	222	190	64	11	600

Health intervention		Very poor	Poor	Average	Good	Very good	Total
V12	New born check up within 24 hours	50	187	152	117	94	600
V13	Breastfeeding initiated within 1 hour of birth	96	146	215	117	26	600
V14	Exclusive breastfeeding during first 6 months	218	258	99	23	2	600
	Rural Population						
V1	Registration of pregnant mothers in first trimester	72	206	162	109	43	592
V2	Three antenatal care visits	80	165	133	107	107	592
V3	At least 1 tetanus toxoid injection	1	43	122	157	269	592
V4	Institutional delivery	93	179	171	79	70	592
V5	Post natal visit within 48 hours	79	212	119	111	71	592
V6	BCG Vaccination	1	1	22	103	465	592
V7	OPV3 vaccination	13	59	127	178	215	592
V8	DPT3 vaccination	13	65	159	172	183	592
V9	Measles vaccination	7	46	117	170	252	592

Health intervention		Very poor	Poor	Average	Good	Very good	Total
V10	Vitamin A prophylaxis	25	116	171	186	94	592
V11	Given ORS during diarrhoea	147	216	158	52	19	592
V12	New born check up within 24 hours	71	210	128	109	74	592
V13	Breastfeeding initiated within 1 hour of birth	97	147	205	111	32	592
V14	Exclusive breastfeeding during first 6 months	218	243	112	17	2	592

Source: Author's calculations

Table 4
Summary measure of inter-district variation in within-district inequality in coverage of different health interventions

Measure	Minimum	Q1	Median	Q3	Maximum	IQR	N
Index of inter-median difference (*IMD*)							
Total	0.100	0.211	0.289	0.407	1.160	0.020	600
Rural	0.090	0.232	0.320	0.434	1.190	0.020	592
Index of inter-individual difference (*IID*)							
Total	0.040	0.074	0.098	0.138	0.370	0.060	600
Rural	0.040	0.080	0.108	0.147	0.380	0.070	592

Source: Author's calculations

Table 3
Factor structure

Factor 1			Factor 2			Factor 3		
Variable	Factor loadings		Variable	Factor loadings		Variable	Factor loadings	
	Total	Rural		Total	Rural		Total	Rural
V1	0.789	0.797	V6	0.850	0.865	V11	0.661	0.663
V2	0.761	0.765	V7	0.845	0.836	V13	0.736	0.717
V3	0.636	0.639	V8	0.832	0.833	V14	0.799	0.792
V4	0.861	0.856	V9	0.861	0.868			
V5	0.895	0.900	V10	0.809	0.808			
V12	0.889	0.891						
			Proportion (per cent) of variation explained					
	34.17	34.00		34.02	33.54		14.11	13.64

K-M-O Measure			Bartlett's Test of Sphericity		
	Total	0.914		Total	11303.8
	Rural	0.911		Rural	10636.4

Remarks: Variables with a factor loading of at least 0.60 are shown in the table.
Source: Author's calculations.

Table 6
Summary measures of inter-district distribution in the district health system performance index

Summery measure	Total population				Rural population			
	All domains	Maternal health	Child immunisation	Child health	All domains	Maternal health	Child immunisation	Child health
Minimum	16.46	13.65	21.25	3.69	0.00	12.19	0.00	3.29
Q1	40.95	34.75	58.34	24.07	38.90	31.26	56.75	23.30
Median	54.24	49.41	79.50	35.16	51.40	44.68	73.40	35.13
Q3	68.02	71.10	85.81	42.91	66.65	66.62	85.99	43.56
Maximum	84.31	99.13	97.08	68.88	85.75	99.32	98.08	78.19
IQR	27.07	36.35	27.47	18.84	27.75	35.36	29.23	20.27
N	600	600	600	600	592	592	592	592

Source: Author's calculations

Table 7
Distribution of districts by the level of district health system performance

	Total population						Rural population					
	Very poor	Poor	Average	Good	Very good	Total	Very poor	Poor	Average	Good	Very good	Total
All domains combined	6	132	217	222	23	600	8	157	214	190	23	592
Maternal health domain	17	195	173	125	90	600	20	236	151	112	73	592
Child immunisation domain	0	33	127	202	238	600	3	36	135	187	231	592
Child health domain	116	278	199	7	0	600	125	260	197	10	0	592

Source: Author's calculations

Table 8
Districts having best and poorest district health system

	Total population			Rural population		
	District	State/UT	Performance index	District	State/UT	Performance index
			Best performing districts			
1.	Thiruvananthapuram	Kerala	84.31	Pathanamthitta	Kerala	85.75
2.	North Goa	Goa	84.10	Thrissur	Kerala	85.48
3.	Thiruvallur	Tamilnadu	83.37	Kancheepuram	Tamilnadu	85.37
4.	The Nilgiris	Tamilnadu	83.27	North Goa	Goa	85.32
5.	Kottayam	Kerala	83.08	Karaikal	Puducherry	84.65
6.	Chennai	Tamilnadu	83.07	Haveri	Karnataka	84.48
7.	Wardha	Maharashtra	82.80	South Goa	Goa	83.67
8.	Erode	Tamilnadu	82.80	Solapur	Maharashtra	83.50
9.	Sindhdurg	Maharashtra	82.68	Sindhdurg	Maharashtra	82.96
10.	Dakshin Kannada	Karnataka	81.93	Khammam	Andhra Pradesh	82.36

	Total population			Rural population		
	District	State/UT	Performance index	District	State/UT	Performance index
			Poorest performing districts			
1.	Baharaich	Uttar Pradesh	16.46	North Delhi	Delhi	0.00
2.	Balrampur	Uttar Pradesh	16.99	Baghpat	Uttar Pradesh	15.58
3.	Shrawasti	Uttar Pradesh	17.27	Firozabad	Uttar Pradesh	16.57
4.	Budaun	Uttar Pradesh	17.42	Gautam Budh Nagar	Uttar Pradesh	16.75
5.	Mewat	Haryana	17.92	Jaunpur	Uttar Pradesh	17.33
6	Sahajahanpur	Uttar Pradesh	18.62	Bhiwani	Haryana	17.40
7.	Farrukhabad	Uttar Pradesh	21.36	Ballia	Uttar Pradesh	17.56
8.	Sitapur	Uttar Pradesh	21.61	Sitapur	Uttar Pradesh	19.61
9.	Gonda	Uttar Pradesh	22.22	Chandauli	Uttar Pradesh	20.27
10.	Kheri	Uttar Pradesh	22.29	Kannauj	Uttar Pradesh	21.37

Source: Author's calculations

Table 9

Performance of the district health system by States/Union Territories

India/State/UT	Total population						Rural population					
	Very poor	Poor	Average	Good	Very good	Total	Very poor	Poor	Average	Good	Very good	Total
AN Islands	0	0	0	1	1	2	0	0	0	1	1	2
Andhra Pradesh	0	0	1	21	1	23	0	0	2	19	1	22
Arunachal Pradesh	0	3	13	0	0	16	0	6	10	0	0	16
Assam	0	3	19	5	0	27	0	4	20	3	0	27
Bihar	0	31	6	0	0	37	0	31	6	0	0	37
Chandigarh	0	0	0	1	0	1	0	0	0	1	0	1
Chhattisgarh	0	0	13	3	0	16	0	2	12	2	0	16
Dadra & Nagar Haveli	0	0	1	0	0	1	0	0	1	0	0	1
Daman & Diu	0	0	0	2	0	2	0	0	0	2	0	2
Delhi	0	0	1	8	0	9	1	1	1	4	0	7
Goa	0	0	0	0	2	2	0	0	0	0	2	2
Gujarat	0	1	12	12	0	25	0	1	13	11	0	25
Haryana	1	1	16	2	0	20	1	1	17	1	0	20
Himachal Pradesh	0	0	2	9	1	12	0	0	3	8	1	12
Jammu & Kashmir	0	0	4	10	0	14	0	0	4	10	0	14
Jharkhand	0	7	14	1	0	22	0	9	13	0	0	22
Karnataka	0	0	2	24	1	27	0	0	6	20	1	27
Kerala	0	0	0	10	4	14	0	0	0	9	5	14
Lakshadweep	0	0	0	0	1	1	0	0	0	0	1	1
Madhya Pradesh	0	13	28	4	0	45	0	22	21	2	0	45

India/State/UT	Total population						Rural population					
	Very poor	Poor	Average	Good	Very good	Total	Very poor	Poor	Average	Good	Very good	Total
Maharashtra	0	0	3	28	4	35	0	1	3	25	4	33
Manipur	0	2	3	4	0	9	0	2	4	3	0	9
Meghalaya	0	4	3	0	0	7	0	4	3	0	0	7
Mizoram	0	0	4	4	0	8	0	0	6	2	0	8
Nagaland	na	na	na	na	na	na	na	na	na	na	na	na
Orissa	0	1	16	13	0	30	0	2	17	11	0	30
Puducherry	0	0	0	3	0	3	0	0	0	1	1	2
Punjab	0	0	3	17	0	20	0	0	3	17	0	20
Rajasthan	0	8	23	1	0	32	0	11	21	0	0	32
Sikkim	0	0	1	3	0	4	0	0	1	3	0	4
Tamilnadu	0	0	0	22	8	30	0	0	0	23	6	29
Tripura	0	1	3	0	0	4	0	1	3	0	0	4
Uttar Pradesh	5	56	9	0	0	70	6	58	6	0	0	70
Uttarakhand	0	1	11	1	0	13	0	1	12	0	0	13
West Bengal	0	0	6	13	0	19	0	0	6	12	0	18
India	6	132	217	222	23	600	8	157	214	190	23	592

Source: Author's calculations

Appendix Table

Performance index for the health system as a whole and for the three components of the health system in districts of India

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Andaman & Nicobar Islands								
Andamans	74.20	68.64	90.58	55.38	74.47	68.60	90.62	56.40
Nicobars	81.07	78.70	89.35	68.88	80.53	77.84	84.37	78.19
Andhra Pradesh								
Adilabad	53.73	51.64	72.83	28.41	52.02	47.73	70.31	30.72
Anantapur	72.71	74.22	90.28	41.04	71.58	80.87	86.70	32.97
Chittoor	74.64	77.86	85.11	49.11	78.24	85.96	88.67	45.50
Cuddapah	70.90	80.01	84.26	34.89	59.94	58.53	69.54	44.15
East Godavari	75.43	85.29	83.58	43.74	74.76	82.30	92.69	34.69
Guntur	71.70	80.35	83.13	38.11	69.42	76.52	85.19	32.91
Hyderabad	72.89	89.32	85.51	30.31	na	na	na	na
Karimnagar	77.37	92.11	92.87	32.67	75.55	77.60	86.26	51.00
Khammam	72.31	76.79	86.99	40.05	82.36	89.25	92.83	50.22
Krishna	81.55	89.77	93.29	46.75	73.27	85.95	91.98	28.15
Kurnool	66.82	67.62	82.72	38.80	67.43	65.54	78.21	50.30
Mahbubnagar	69.85	74.17	87.58	35.02	71.83	78.67	82.39	40.87
Medak	70.70	81.01	92.58	26.55	70.79	77.64	83.42	37.58
Nalgonda	76.33	83.38	92.26	39.01	79.82	90.18	92.72	40.73

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Nellore	71.23	85.41	81.80	32.86	67.74	72.10	82.18	36.06
Nizamabad	73.24	86.11	90.51	29.69	71.70	72.33	89.52	40.67
Prakasam	69.00	78.45	84.98	30.60	73.09	85.87	93.84	26.46
Rangareddi	72.88	89.03	90.46	26.65	75.53	83.89	82.90	46.26
Srikakulam	69.03	73.97	83.11	37.33	64.17	62.13	80.64	39.67
Visakhapatnam	64.03	67.14	74.33	39.84	71.00	79.05	91.64	29.02
Vizianagaram	69.49	69.40	81.10	48.05	69.43	73.18	87.23	34.76
Warangal	71.26	85.31	86.58	28.81	69.98	74.38	85.67	36.58
West Godavari	77.57	85.25	89.10	44.20	70.65	83.23	81.63	32.94
Arunachal Pradesh								
Anjaw	39.36	37.26	39.53	44.48	37.23	31.19	39.47	50.14
Changlang	52.75	51.41	51.50	59.44	43.46	32.63	55.93	47.78
Dibang Valley	52.84	49.69	53.48	59.58	44.69	47.67	45.91	35.61
East Kameng	30.02	28.15	33.46	27.00	53.57	50.16	54.59	60.24
East Siang	43.95	43.25	42.87	48.52	43.85	37.01	52.95	42.10
Kurung Kumey	43.39	44.73	38.97	52.20	30.03	40.65	19.59	40.33
Lohit	41.35	48.29	54.76	14.42	45.16	38.55	54.64	41.96
Lower Dibang Valley	47.35	42.21	55.00	43.61	47.05	43.93	49.12	50.21
Lower Subansiri	43.61	49.61	37.15	46.98	39.44	37.91	37.21	50.17
Papum	51.19	57.48	48.28	44.50	24.93	18.14	38.15	19.35

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Tawang	48.20	43.78	55.51	43.25	39.61	37.40	39.76	45.25
Tirap	47.19	38.32	58.62	46.31	24.13	15.48	32.05	36.30
Upper Siang	24.08	15.44	32.04	35.45	44.68	53.87	36.37	46.48
Upper Subansiri	41.57	46.78	37.00	41.37	43.54	44.67	39.10	53.18
West Kameng	48.28	46.20	50.11	49.12	51.96	50.02	51.10	59.51
West Siang	40.39	41.19	39.57	40.45	40.02	46.25	55.05	12.75
Assam								
Barpeta	50.20	36.53	72.10	45.28	46.65	32.38	69.80	43.05
Baska	53.88	44.52	73.90	39.92	57.32	45.99	72.77	55.18
Bongaigaon	47.82	35.09	66.29	46.07	42.63	38.53	57.88	25.87
Cachar	43.06	39.78	58.48	24.96	42.29	33.74	60.82	30.39
Chirang	46.49	32.29	69.84	42.15	58.96	48.04	79.15	47.61
Darrang	51.82	39.86	70.93	45.89	30.86	17.09	48.83	43.54
Dhemaji	41.01	27.84	57.06	47.23	57.12	42.88	78.62	53.22
Dhubri	32.80	19.46	49.66	42.74	54.11	44.55	74.02	40.67
Dibrugarh	66.27	55.61	89.28	49.41	62.20	51.46	82.72	49.51
Goalpara	40.84	30.10	51.36	49.22	45.99	31.86	66.34	46.64
Golaghat	50.48	39.12	69.94	42.61	42.24	30.15	54.55	52.20
Hailakandi	35.68	36.61	48.92	15.67	33.27	27.37	47.79	22.22
Jorhat	58.88	46.32	78.85	52.06	36.30	34.05	49.10	20.26

State	District	Total population				Rural population			
		Health system performance index	Performance index in			Health system performance index	Performance index in		
			Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
	Kamrup	68.63	67.81	80.83	47.64	50.28	36.40	71.18	47.84
	Kamrup Metro	63.48	54.25	83.55	47.87	50.48	42.72	65.14	40.90
	Karbi Anglong	52.13	39.31	73.75	44.73	47.38	35.96	62.82	47.08
	Karimganj	37.27	36.02	49.74	20.20	61.41	51.68	82.59	45.57
	Kokrajhar	43.29	32.15	54.24	51.66	49.13	34.76	71.43	46.39
	Lakhimpur	47.97	36.95	63.32	46.20	35.24	34.82	48.72	16.38
	Marigaon	47.78	34.00	68.00	46.51	65.17	51.99	89.71	52.17
	Nagaon	43.58	36.39	60.65	30.40	43.02	30.09	52.46	64.39
	Nalbari	61.58	52.30	82.58	45.10	40.10	26.53	56.10	49.16
	North Cachar Hills	46.16	43.39	55.15	34.94	47.76	33.58	68.36	47.57
	Sibsagar	60.25	50.70	78.44	48.43	54.40	36.35	86.24	47.84
	Sonitpur	58.43	48.19	73.44	53.71	51.07	38.76	70.65	45.72
	Tinsukia	52.53	45.85	68.15	38.97	53.46	44.47	76.36	35.22
	Udalguri	50.12	38.04	65.81	50.68	49.23	36.71	64.92	51.86
Bihar									
	Araria	30.70	27.42	54.79	9.99	32.84	27.73	48.60	19.11
	Aurangabad	38.20	25.49	78.96	17.67	27.71	22.94	52.13	9.39
	Banka	33.68	30.32	56.58	12.44	31.98	25.27	63.82	10.53
	Begusarai	35.71	36.49	60.09	9.66	45.21	45.49	68.29	16.15
	Bhagalpur	42.09	27.88	71.08	32.26	41.42	28.30	70.37	29.07

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Bhojpur	36.70	27.30	55.68	27.50	29.88	16.12	63.48	21.83
Buxar	34.67	30.75	49.84	19.32	36.48	33.37	67.15	10.18
Darbhanga	36.40	32.33	65.02	11.98	32.72	33.58	41.16	17.46
Gaya	29.36	22.89	53.17	12.81	41.63	38.76	75.57	11.49
Gopalganj	37.37	35.76	70.33	9.06	34.86	32.36	68.37	8.02
Jamui	27.10	24.50	34.92	18.78	42.06	24.17	75.86	39.23
Jehanabad	38.00	34.70	65.33	12.83	24.98	16.70	45.64	15.48
Kaimur	32.68	33.86	41.60	16.77	39.24	29.10	75.52	16.54
Katihar	31.41	22.85	55.42	17.28	37.65	35.85	71.14	8.91
Khagaria	35.12	33.76	67.75	7.93	33.08	24.61	69.65	11.10
Kishanganj	29.17	33.10	41.66	9.10	35.94	31.90	64.63	11.44
Lakhisarai	32.07	26.27	50.44	17.46	36.26	28.42	56.59	22.26
Madhepura	31.62	21.27	60.72	17.11	26.64	23.00	35.54	18.90
Madhubani	27.70	24.97	59.04	5.75	40.23	23.54	75.28	32.77
Munger	46.83	46.87	67.48	19.38	26.00	23.32	44.06	9.33
Muzaffarpur	34.53	27.98	69.08	10.79	30.38	20.66	55.37	18.15
Nalanda	43.04	31.68	70.37	27.66	26.94	21.29	55.09	8.35
Nawada	32.23	26.38	63.19	10.33	28.17	24.98	56.04	7.01
Pashchim Champaran	25.85	23.99	43.39	8.88	30.41	26.98	54.06	9.97
Patna	39.76	34.88	58.30	21.70	35.71	30.46	61.37	14.03

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Purba Champaran	32.48	36.47	53.48	7.37	37.75	24.61	79.04	17.83
Purnia	27.79	22.97	54.96	8.51	27.22	19.48	52.51	12.47
Rohtas	37.43	34.03	60.93	14.56	42.33	47.56	58.65	14.22
Saharsa	30.69	17.22	63.75	21.34	38.93	34.96	66.64	13.58
Samastipur	36.77	33.39	66.90	10.98	28.63	25.35	60.56	6.15
Saran	40.00	30.14	75.43	17.20	32.28	25.42	51.99	18.15
Sheikhpura	41.47	46.92	58.82	13.24	32.79	36.19	53.61	7.66
Sheohar	25.26	17.28	45.72	15.16	33.42	29.98	55.62	12.52
Sitamarhi	28.39	24.32	53.33	9.03	36.05	36.31	60.54	9.90
Siwan	40.97	38.86	74.08	11.16	28.78	30.84	41.90	9.62
Supaul	27.86	24.95	56.13	6.72	36.52	25.88	57.77	27.92
Vaishali	42.90	25.78	75.28	37.95	31.44	20.90	60.63	17.32
Chandigarh								
Chandigarh	66.32	75.13	80.09	31.11	62.67	65.18	70.54	42.51
Chhattisgarh								
Bastar	55.01	40.31	76.87	52.11	55.80	43.31	80.07	43.17
Bilaspur	53.34	44.13	76.32	35.59	42.58	26.57	72.61	37.14
Dantewada	57.41	41.72	81.53	53.42	40.08	26.03	64.08	37.11
Dhamtari	64.49	57.25	81.00	49.68	52.36	40.69	74.06	41.89
Durg	61.22	51.36	83.60	44.17	35.81	22.64	63.20	27.77

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Janjgir-Champa	50.27	38.16	73.18	39.62	48.69	36.23	72.53	38.16
Jashpur	43.40	27.78	73.09	36.40	55.83	38.83	81.18	55.01
Kanker	59.55	44.77	84.87	50.57	52.47	38.04	76.70	45.98
Kawardha	48.33	37.36	74.53	31.70	59.15	44.06	84.89	50.72
Korba	43.72	34.24	66.12	29.14	59.65	46.58	82.68	49.52
Koriya	41.49	31.61	71.16	21.84	53.42	37.63	76.68	52.61
Mahasamund	63.25	53.14	86.05	45.93	61.25	49.42	86.35	44.97
Raigarh	54.14	44.03	75.18	40.46	62.33	53.78	79.71	49.19
Raipur	57.38	45.57	78.11	47.65	35.84	23.16	68.90	21.36
Rajnandgaon	57.11	46.42	80.88	40.75	47.17	35.32	73.40	32.73
Surguja	41.11	27.36	65.00	36.52	50.82	40.43	75.23	34.30
Dadra and Nagar Haveli								
Dadra Nagar Haveli	59.19	56.53	77.64	34.39	55.19	49.14	75.18	34.50
Daman and Diu								
Daman	74.39	90.34	88.74	30.38	65.12	65.27	93.66	26.52
Diu	66.99	71.93	92.41	25.97	76.96	89.93	90.59	34.96
Delhi								
Central Delhi	68.96	84.56	83.16	26.80	na	na	na	na
East Delhi	61.66	73.60	78.97	22.13	61.56	75.06	69.20	28.19
New Delhi	63.20	72.28	78.22	27.31	na	na	na	na

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
North Delhi	61.09	72.51	71.38	27.73	0.00	43.38	0.00	17.87
North East Delhi	55.93	67.28	67.18	22.98	63.68	75.15	82.67	22.19
North West Delhi	62.40	74.45	77.71	23.97	21.76	29.80	16.68	19.07
South Delhi	62.43	72.12	76.72	26.79	48.31	43.75	74.85	21.07
South West Delhi	63.19	75.07	84.73	20.54	68.54	78.87	87.71	26.36
West Delhi	61.84	74.91	77.27	22.73	62.52	68.90	83.43	24.14
Goa								
North Goa	84.10	96.86	93.62	46.13	85.32	98.78	94.18	46.46
South Goa	80.59	94.61	88.45	43.66	83.67	97.07	95.21	42.05
Gujarat								
Ahmadabad	66.81	73.33	73.39	42.51	45.51	50.88	51.87	24.98
Amreli	56.35	60.07	73.38	25.54	67.02	67.62	86.83	34.69
Anand	64.96	73.80	80.41	28.52	74.18	82.68	87.16	38.10
Banas Kantha	47.05	42.76	58.44	35.18	55.38	58.24	71.79	25.83
Bharuch	59.63	57.42	77.43	34.80	75.28	74.06	90.55	49.81
Bhavnagar	59.09	57.04	69.37	43.71	54.14	37.87	78.11	53.62
Dohad	45.45	51.00	52.83	23.94	65.07	65.57	85.38	32.75
Gandhinagar	68.03	70.55	79.64	42.60	56.00	49.79	70.32	42.89
Jamnagar	67.87	70.73	78.39	43.41	64.00	63.39	79.01	39.05
Junagarh	66.09	68.57	80.71	37.34	59.22	67.62	75.72	23.25

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Kachchh	50.66	54.03	61.39	27.26	51.10	40.53	74.29	36.26
Kheda	59.83	69.43	77.27	22.53	52.06	50.62	65.59	31.64
Mahesana	67.38	71.46	85.34	33.06	46.07	41.54	57.01	35.31
Narmada	56.15	41.15	78.61	52.96	51.72	53.78	63.24	28.62
Navsari	69.12	80.21	78.97	34.98	48.44	38.99	67.71	36.51
Panch	53.89	54.37	66.31	31.99	63.46	61.49	83.70	34.78
Patan	63.86	64.25	84.48	32.06	64.51	69.34	78.86	32.90
Porbandar	68.78	72.67	87.58	33.63	49.25	47.47	62.27	30.32
Rajkot	69.87	75.46	79.99	41.86	64.78	66.68	77.19	39.16
Sabar Kantha	53.93	56.75	64.17	31.35	56.32	49.50	76.52	36.59
Surat	70.47	77.73	88.89	31.74	43.99	39.33	61.34	25.69
Surendranagar	47.45	46.97	61.00	26.55	66.68	65.81	80.12	43.87
The Dangs	33.97	19.24	53.71	44.63	33.91	19.08	53.95	45.37
Vadodara	56.68	51.72	72.84	38.65	67.34	68.11	79.90	42.99
Valsad	60.46	60.74	68.87	43.69	60.87	59.80	69.94	45.22
Haryana								
Ambala	60.74	66.27	84.06	22.48	47.06	47.80	67.90	18.39
Bhiwani	46.90	47.27	68.91	18.21	17.40	26.69	20.22	4.14
Faridabad	38.01	42.52	55.04	11.86	54.82	61.04	80.46	16.33
Fatehabad	43.23	46.82	69.34	11.41	53.45	58.50	85.30	13.53

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Gurgaon	49.29	53.93	73.26	15.25	46.34	52.32	71.04	11.99
Hisar	46.39	50.11	68.83	14.87	51.47	57.63	74.59	15.60
Jhajjar	49.37	52.87	72.24	16.70	48.40	53.06	73.07	13.98
Jind	47.86	53.32	69.61	14.92	48.25	50.63	75.11	14.42
Kaithal	49.78	55.53	76.91	13.39	44.27	47.50	69.15	12.41
Karnal	54.33	61.53	85.42	13.50	44.17	45.94	68.41	13.66
Kurukshetra	59.93	68.58	79.07	22.16	43.25	45.66	73.15	10.39
Mahendragarh	53.56	58.14	74.96	19.52	57.11	66.47	76.71	18.94
Mewat	17.92	27.03	21.25	4.38	53.26	60.39	80.94	13.93
Panchkula	64.28	73.32	85.92	23.21	58.26	59.66	79.50	25.57
Panipat	46.20	53.01	68.30	12.90	50.88	52.93	72.15	19.53
Rewari	58.73	68.85	77.03	20.78	51.46	50.99	72.51	22.66
Rohtak	55.68	56.62	79.31	22.79	61.55	67.96	87.40	20.31
Sirsa	50.26	58.79	73.55	13.73	59.58	64.90	78.02	24.81
Sonipat	56.01	64.39	81.62	16.12	44.81	50.65	65.46	13.01
Yamunanagar	55.88	66.57	81.73	14.62	32.28	34.13	45.22	12.27
Himachal Pradesh								
Bilaspur	74.93	67.20	92.67	58.42	55.57	38.49	88.01	44.79
Chamba	56.60	42.04	86.11	42.27	76.09	67.59	92.90	62.59
Hamirpur	80.28	70.93	97.08	68.54	68.98	57.22	94.21	51.07

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Kangra	69.19	59.29	91.85	50.78	55.45	40.00	86.01	42.52
Kinnaur	63.39	51.80	90.05	44.35	68.27	60.57	95.84	39.97
Kullu	70.08	59.75	94.09	50.71	69.31	59.25	91.31	52.01
Lahul & Spiti	65.85	66.51	88.38	31.63	80.36	71.09	96.56	69.48
Mandi	57.06	40.72	88.35	45.04	63.71	51.95	90.08	45.20
Shimla	66.81	60.26	86.11	46.51	66.09	57.32	91.09	42.84
Sirmaur	60.05	45.61	91.32	42.55	59.03	43.13	92.36	42.92
Solan	66.09	58.98	89.18	42.29	62.45	53.51	83.57	44.84
Una	69.35	62.27	95.70	41.42	66.02	65.92	88.42	32.31
Jammu & Kashmir								
Anantanag	69.20	69.00	72.28	62.76	68.25	55.54	86.66	63.42
Badgam	74.75	72.82	81.99	63.74	45.11	40.34	54.98	36.66
Baramula	67.97	67.65	71.03	61.82	74.15	71.36	81.23	65.18
Doda	46.28	42.45	55.72	36.46	67.88	58.94	87.86	51.17
Jammu	67.96	73.75	80.37	37.21	74.06	71.47	84.15	59.14
Kargil	68.96	57.15	87.19	61.73	60.70	54.14	69.59	57.67
Kathua	70.23	69.03	89.99	40.27	54.08	42.03	77.63	41.70
Kupwara	60.83	54.72	69.66	56.70	67.88	66.77	71.17	62.97
Leh	68.84	62.27	87.41	49.37	69.43	66.58	89.06	41.80
Pulwama	73.09	71.16	83.05	57.33	67.35	66.36	82.27	42.73

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Punch	42.82	31.91	56.97	43.85	41.54	30.17	55.55	45.10
Rajauri	51.86	41.70	62.76	55.51	50.75	39.88	62.44	55.61
Srinagar	78.36	85.58	85.61	51.12	67.45	65.69	71.16	63.13
Udhampur	56.90	46.66	78.56	42.25	73.35	71.04	83.40	57.95
Jharkhand								
Bokaro	55.02	45.65	78.04	37.24	42.29	25.43	85.84	26.38
Chatra	37.71	26.30	60.36	29.03	39.72	25.55	59.83	43.57
Deoghar	40.58	26.71	60.70	42.32	31.52	23.91	41.28	32.31
Dhanbad	48.80	46.35	64.61	28.09	45.43	36.47	64.75	32.86
Dumka	39.93	26.06	69.66	29.35	38.40	27.37	53.92	38.78
Garhwa	40.42	23.47	78.77	30.20	47.59	35.35	76.01	31.56
Giridih	32.74	25.49	41.77	33.40	40.11	23.04	78.81	30.35
Godda	33.96	20.71	51.47	41.30	33.51	20.15	51.40	41.63
Gumla	45.58	29.93	81.63	30.98	41.28	26.16	67.43	38.49
Hazaribagh	54.90	44.52	82.61	34.04	44.01	39.79	69.29	18.55
Jamtara	39.92	29.10	55.70	38.45	38.89	23.05	77.57	26.24
Kodarma	47.46	39.70	66.07	32.93	38.58	24.28	68.40	29.91
Latehar	42.92	26.72	86.11	25.26	51.85	33.73	88.07	41.17
Lohardaga	55.15	37.74	90.51	41.83	36.25	19.54	63.66	42.35
Pakaur	37.41	20.81	64.35	41.88	53.84	42.00	83.52	33.97

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Palamu	42.28	27.07	68.60	38.75	36.67	25.46	58.55	28.83
Pashchimi Singhbum	46.97	31.43	73.11	42.77	44.60	28.67	71.56	41.96
Purbi Singhbhum	65.51	55.62	91.48	43.55	56.40	43.35	92.62	32.09
Ranchi	54.51	40.98	83.27	39.18	53.62	35.47	90.02	42.01
Sahibganj	30.51	16.42	54.13	34.36	45.16	29.22	81.16	31.64
Seraikela	54.99	39.23	88.98	39.04	29.09	14.89	53.36	34.74
Simdega	40.16	25.02	77.92	25.58	49.75	32.29	85.91	38.13
Karnataka								
Bagalkot	61.67	57.50	73.93	47.17	74.17	78.81	96.17	33.69
Bangalore	76.87	82.95	92.81	40.59	76.65	82.43	92.60	40.18
Bangalore Rural	78.70	92.98	94.55	33.76	55.48	44.97	78.79	39.56
Belgaum	68.09	70.16	83.66	38.54	58.25	50.96	72.82	46.93
Bellary	60.40	55.98	79.62	37.30	69.39	68.22	84.21	44.98
Bidar	68.49	68.47	81.71	44.78	56.45	47.05	79.60	38.20
Bijapur	61.56	61.97	68.38	47.00	75.70	82.98	92.17	37.13
Chamarajanagar	76.85	84.74	92.90	38.41	74.26	83.43	90.91	33.79
Chikmagalur	79.81	86.30	93.98	44.52	71.84	66.91	90.52	48.61
Chitradurga	68.98	65.29	85.77	46.62	70.01	66.63	85.88	47.93
Dakshina Kannada	81.93	92.17	94.45	43.73	73.90	77.61	89.21	41.17
Davanagere	70.36	72.60	84.20	42.30	67.88	67.84	87.76	36.16

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Dharwad	73.24	72.90	87.54	48.17	78.38	83.98	93.10	43.21
Gadag	67.25	70.11	87.84	31.92	76.23	82.79	92.09	38.99
Gulbarga	61.72	57.54	78.38	41.09	66.78	66.19	83.08	39.93
Hassan	76.48	81.22	94.38	39.84	51.63	41.66	69.08	43.09
Haveri	69.24	68.65	86.83	40.95	84.48	90.99	96.26	50.95
Kodagu	78.64	88.99	95.60	36.41	72.20	72.90	93.72	37.11
Kolar	68.80	71.61	94.48	29.07	67.26	67.10	93.75	29.91
Koppal	56.56	47.67	79.43	37.72	56.84	55.03	64.33	45.48
Mandya	76.46	84.04	92.68	38.25	72.72	78.13	96.18	30.58
Mysore	74.50	82.02	96.04	31.99	78.03	94.24	94.86	30.16
Raichur	54.47	48.37	68.60	41.64	68.79	65.54	85.22	45.85
Shimoga	75.96	83.05	90.52	40.10	58.78	51.03	79.01	40.40
Tumkur	72.65	75.76	92.88	36.31	78.74	88.15	95.58	36.90
Udupi	76.67	94.41	94.08	28.28	76.27	79.30	93.50	41.95
Uttara Kannada	75.07	84.43	90.28	36.20	66.92	61.97	85.29	44.66
Kerala								
Alappuzha	81.43	98.08	91.86	38.82	79.58	99.32	90.44	33.45
Ernakulam	77.72	98.05	86.68	34.04	75.89	98.15	77.99	37.38
Idukki	81.08	98.63	89.07	40.23	74.62	98.97	72.23	40.00
Kannur	78.08	97.50	86.00	36.12	77.53	96.96	88.47	32.11

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Kasaragod	79.51	98.22	87.32	38.03	79.38	98.17	91.65	32.84
Kollam	77.89	97.55	90.84	31.16	78.49	98.16	86.66	35.23
Kottayam	83.08	97.52	92.28	43.75	74.98	96.80	78.74	35.18
Kozhikode	75.09	97.77	78.99	35.09	78.32	97.19	86.47	35.85
Malappuram	73.89	99.11	71.60	39.14	80.49	97.98	87.53	40.14
Palakkad	73.65	96.93	76.94	34.08	78.10	98.01	90.65	30.76
Pathanamthitta	78.70	99.13	90.71	31.95	85.75	98.18	94.56	48.12
Thiruvananthapuram	84.31	98.78	91.52	47.16	80.17	95.81	81.85	48.88
Thrissur	78.68	98.29	87.75	35.30	85.48	97.64	91.94	51.30
Wayanad	79.45	95.60	81.19	48.17	81.54	98.53	88.75	41.33
Lakshadweep								
Lakshadweep	80.78	90.51	85.39	53.65	80.67	88.08	83.88	58.88
Madhya Pradesh								
Balaghat	62.01	58.18	82.51	36.35	45.17	37.73	64.35	29.63
Barwani	33.09	29.25	40.38	27.62	39.27	27.58	59.30	34.36
Betul	52.91	41.95	68.54	49.72	52.66	47.93	66.98	36.86
Bhind	40.13	33.37	58.12	25.67	48.15	36.14	63.91	49.05
Bhopal	60.59	55.32	77.15	42.16	43.29	36.39	57.85	32.71
Chhatarpur	35.99	36.33	50.01	15.90	35.07	30.67	39.26	37.12
Chhindwara	51.97	46.14	69.12	34.86	39.28	31.46	49.71	38.27

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Damoh	38.98	34.70	45.31	35.94	27.62	16.09	40.44	41.64
Datia	37.20	32.89	43.84	33.75	39.19	26.63	60.62	35.13
Dewas	55.16	57.76	66.46	31.49	45.26	50.68	54.78	21.36
Dhar	43.47	40.65	56.78	26.87	48.53	47.82	62.02	27.55
Dindori	28.36	16.88	40.72	41.65	30.32	31.32	37.57	16.50
East Nimar	40.52	32.46	57.33	30.03	39.16	42.74	48.14	18.96
Guna	30.34	27.21	39.77	20.55	46.01	38.74	62.53	33.23
Gwalior	46.19	41.87	56.79	35.61	39.68	31.17	60.73	25.46
Harda	49.52	43.26	60.20	42.92	44.60	39.97	59.03	29.44
Hoshangabad	58.12	60.65	73.65	29.63	54.54	58.75	60.45	35.18
Indore	67.91	76.17	74.96	40.55	50.96	50.83	72.21	21.78
Jabalpur	58.27	59.96	67.11	38.67	27.27	20.13	37.46	26.60
Jhabua	32.65	33.05	29.51	40.43	34.49	28.20	52.66	20.13
Katni	46.65	35.34	66.00	39.59	31.42	23.78	48.19	21.96
Mandla	43.66	32.81	60.20	40.19	64.36	58.42	82.00	45.19
Mandsaur	49.50	54.38	60.43	24.37	50.44	43.28	67.76	35.74
Morena	38.21	33.18	54.50	22.84	28.24	24.20	33.42	27.45
Narsimhapur	50.89	52.22	64.99	26.52	29.78	21.76	45.07	23.52
Neemuch	53.45	55.25	70.77	25.06	52.24	52.93	53.74	47.15
Panna	40.03	34.17	53.19	29.61	51.33	50.87	62.96	31.79

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Raisen	41.62	29.97	62.04	35.17	50.21	48.66	64.02	29.90
Rajgarh	41.26	45.84	49.87	20.25	49.61	48.03	65.77	26.90
Ratlam	52.39	51.81	68.91	27.80	29.76	30.45	25.89	39.59
Rewa	44.34	38.97	58.07	31.60	25.56	21.86	33.39	19.58
Sagar	48.48	44.83	61.78	32.65	39.94	35.37	53.27	26.64
Satna	46.03	37.29	56.58	46.62	37.27	29.18	52.58	29.47
Sehore	52.95	52.99	66.96	30.01	43.49	33.81	56.32	43.13
Seoni	53.46	50.53	66.31	36.45	34.53	30.75	42.10	28.30
Shahdol	48.43	46.41	61.87	29.75	43.27	35.12	54.99	40.39
Shajapur	55.79	61.57	62.98	32.80	40.41	28.07	58.56	40.28
Sheopur	33.18	26.61	49.54	21.52	61.22	55.03	83.84	36.87
Shivpuri	30.17	24.91	38.73	26.30	32.33	31.42	47.26	13.66
Sidhi	28.55	20.68	42.17	24.33	54.25	53.00	70.66	30.02
Tikamgarh	31.60	33.06	38.98	17.09	32.90	26.79	41.44	31.16
Ujjain	67.65	66.83	83.82	41.58	42.80	29.54	63.75	40.49
Umaria	40.83	34.89	49.74	37.11	39.74	30.59	53.33	37.00
Vidisha	38.92	36.89	46.90	28.28	43.13	37.42	56.41	31.76
West Nimar	46.30	39.59	65.48	29.33	37.97	30.52	52.34	29.75

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Maharashtra								
Ahmadnagar	77.63	85.62	91.84	40.81	70.64	74.46	87.31	36.82
Akola	71.32	75.05	84.73	41.62	73.90	69.99	91.06	50.66
Amravati	71.76	75.70	82.45	45.12	68.07	67.33	85.43	40.03
Aurangabad	63.85	65.05	79.34	36.15	36.97	30.27	44.00	39.65
Bhandara	73.23	72.45	87.93	48.34	61.08	54.88	74.75	48.53
Bid	68.30	71.84	85.10	35.58	70.03	78.37	92.10	26.99
Buldana	70.23	71.89	85.21	41.65	59.93	57.52	77.53	35.27
Chandrapur	70.96	72.93	88.73	38.75	56.59	55.07	68.99	37.23
Dhule	54.33	55.10	60.46	40.57	71.00	70.15	86.08	45.58
Gadchiroli	62.04	56.44	75.57	48.49	60.48	60.35	76.28	34.38
Gondiya	75.25	73.52	91.56	49.61	75.60	71.48	93.63	51.37
Hingoli	59.12	62.20	72.11	32.40	67.50	72.01	84.96	32.63
Jalgaon	60.25	60.99	71.88	38.23	69.83	69.85	80.87	48.65
Jalna	67.08	68.87	85.75	34.82	65.52	63.21	86.86	35.84
Kolhapur	78.13	89.12	90.59	39.76	66.35	67.78	82.63	36.71
Latur	67.47	73.81	84.84	31.25	73.50	79.90	94.41	32.28
Mumbai	78.82	90.49	89.80	41.20	na	na	na	na
Mumbai (Suburban)	77.10	88.89	90.07	37.54	na	na	na	na
Nagpur	80.04	86.59	92.94	46.14	51.90	49.95	59.12	41.46

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Nanded	67.08	67.96	84.83	36.89	77.64	87.36	91.24	38.92
Nandurbar	41.02	36.04	47.35	39.70	76.98	84.34	90.81	40.86
Nashik	69.47	69.73	83.45	44.26	64.51	58.65	82.91	44.15
Osmanabad	67.06	70.42	82.15	36.52	80.84	87.82	96.47	42.58
Parbhani	70.15	71.80	84.60	42.23	80.92	84.12	95.45	48.97
Pune	77.32	87.09	93.05	37.08	75.58	81.33	91.90	38.92
Raigarh	72.07	77.38	87.65	37.86	69.72	68.53	85.73	43.78
Ratnagiri	70.38	79.92	92.43	26.81	68.48	68.66	86.87	37.92
Sangli	74.15	82.74	92.44	33.43	68.04	65.50	86.27	41.73
Satara	80.70	88.47	96.24	42.24	69.22	73.54	88.32	32.69
Sindhudurg	82.68	93.40	92.76	46.65	82.96	86.00	93.49	56.53
Solapur	71.68	79.02	88.79	33.80	83.50	93.13	93.83	47.76
Thane	71.30	77.88	86.80	35.85	66.43	69.05	81.30	36.71
Wardha	82.80	87.26	92.39	56.01	68.95	67.77	87.52	40.05
Washim	66.04	69.70	81.18	35.23	68.27	69.72	86.08	36.65
Yavatmal	69.61	68.75	87.15	41.75	67.22	66.89	87.21	35.87
Manipur								
Bishnupur	66.49	65.64	71.95	56.75	59.01	61.83	56.84	57.63
Chandel	48.14	45.18	55.23	40.34	38.55	26.72	53.25	43.40
Churachandpur	40.61	39.29	43.96	36.33	40.86	39.54	43.96	37.07

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Imphal East	63.50	67.18	61.75	59.27	23.34	20.05	26.11	25.90
Imphal West	79.14	83.42	83.55	61.11	49.41	37.90	67.33	44.73
Senapati	49.19	37.83	67.18	43.84	63.60	61.03	71.01	53.75
Tamenglong	23.24	19.97	26.13	25.32	49.17	44.76	58.52	40.51
Thoubal	67.72	70.87	72.07	52.20	77.44	77.76	85.01	60.93
Ukhrul	38.42	26.70	53.09	42.52	65.84	64.73	73.20	52.91
Meghalaya								
East Garo Hills	24.93	16.70	29.85	42.60	52.01	42.50	67.50	45.30
East Khasi Hills	57.25	52.07	70.48	43.62	31.44	20.81	41.44	44.61
Jaintia Hills	44.09	32.89	59.66	43.23	30.40	22.11	35.25	46.76
Ri Bhoi	49.07	35.86	68.98	46.13	33.53	23.21	40.60	52.40
South Garo Hills	33.25	23.79	39.04	50.79	43.02	31.24	58.84	44.25
West Garo Hills	33.96	22.87	44.24	46.76	21.94	14.53	25.36	42.97
West Khasi Hills	33.10	25.17	38.27	45.25	48.61	34.57	69.20	47.71
Mizoram								
Aizawl	73.80	76.23	84.51	49.23	53.10	42.03	66.35	55.01
Champhai	58.44	53.24	70.06	47.30	47.07	37.14	60.71	45.44
Kolasib	65.27	60.38	75.33	55.80	54.45	47.50	66.25	47.29
Lawngtlai	46.81	37.25	60.12	44.52	55.01	42.85	77.73	43.83
Lunglei	61.99	55.33	80.68	43.22	50.55	37.06	67.16	54.47

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Mamit	53.02	42.19	68.07	50.47	66.54	62.93	82.00	45.77
Saiha	59.26	50.73	78.33	44.08	65.42	60.52	82.93	44.36
Serchhip	67.32	67.21	82.82	41.01	52.94	42.22	73.85	41.04
Nagaland								
Dimapur	na	na	na	na	na	na	na	na
Kohima	na	na	na	na	na	na	na	na
Mokokchung	na	na	na	na	na	na	na	na
Mon	na	na	na	na	na	na	na	na
Phek	na	na	na	na	na	na	na	na
Tuensang	na	na	na	na	na	na	na	na
Wokha	na	na	na	na	na	na	na	na
Zunheboto	na	na	na	na	na	na	na	na
Orissa								
Anugul	52.35	38.39	84.14	35.32	49.11	34.44	67.60	54.18
Balangir	60.14	47.71	82.04	49.80	50.29	36.63	74.24	42.56
Baleshwar	64.89	50.25	89.22	55.97	49.14	33.28	75.45	45.22
Bargarh	65.74	56.79	87.51	47.04	49.94	34.60	83.95	34.77
Baudh	50.81	35.87	77.98	42.03	58.98	46.10	83.10	46.90
Bhadrak	59.10	41.96	85.73	55.24	52.86	39.49	80.72	38.65
Cuttack	62.64	56.85	85.32	37.62	71.50	63.76	93.34	49.41

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Debagarh	50.62	35.38	76.44	44.59	65.55	55.66	87.14	48.92
Dhenkanal	55.03	42.20	82.15	39.86	66.27	53.52	89.85	53.38
Gajapati	38.62	27.39	58.04	33.24	44.69	24.44	80.18	47.78
Ganjam	50.66	43.69	65.26	39.35	59.80	47.12	85.15	45.42
Jagatsinghapur	70.80	63.79	92.48	47.85	49.46	40.70	65.88	39.76
Jajapur	64.63	54.12	89.59	45.19	65.00	54.18	89.86	46.15
Jharsuguda	66.41	57.29	90.00	45.64	60.66	47.82	83.18	50.49
Kalahandi	49.39	35.52	67.15	52.36	65.12	55.12	87.66	47.52
Kandhamal	47.95	29.29	78.15	48.69	45.41	28.25	66.40	58.22
Kendrapara	60.93	46.53	88.78	47.22	36.98	24.72	57.64	33.89
Kendujhar	49.66	36.00	77.63	36.85	57.84	40.45	84.96	54.77
Khordha	62.95	54.28	83.32	45.83	60.71	45.54	88.94	48.59
Koraput	47.92	28.55	81.07	47.29	68.63	57.44	89.18	56.18
Malkangiri	45.29	28.17	66.14	57.39	53.50	37.89	81.70	44.64
Mayurbhanj	60.16	48.09	83.73	46.61	61.25	54.68	84.46	36.91
Nabarangapur	48.16	31.19	68.79	58.40	60.09	45.05	85.13	52.33
Nayagarh	50.38	36.73	74.24	42.53	47.10	28.11	77.76	49.69
Nuapada	58.06	46.85	73.79	54.75	57.65	46.15	73.39	55.45
Puri	65.76	56.36	87.75	47.68	49.57	36.64	76.36	36.39
Rayagada	41.71	26.53	59.68	52.61	39.99	24.65	57.54	54.60

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Sambalpur	65.02	53.24	85.82	54.01	64.01	49.36	88.51	55.15
Sonapur	68.80	57.96	89.19	55.73	47.78	30.46	68.91	59.70
Sundargarh	58.15	44.77	83.61	45.66	50.63	35.45	78.08	42.43
Puducherry								
Karaikal	77.32	91.03	92.20	34.08	84.65	90.13	92.06	58.92
Mahe	na	na	na	na	na	na	na	na
Pondicherry	79.13	93.49	93.04	35.76	74.29	87.28	93.55	28.21
Yanam	62.84	65.31	65.98	50.91	na	na	na	na
Punjab								
Amritsar	69.12	78.19	93.06	25.05	53.70	70.42	69.76	14.36
Barnala	56.12	74.26	74.46	14.40	62.57	73.99	90.87	16.46
Bathinda	70.36	72.23	92.51	34.14	67.46	62.58	95.56	34.55
Faridkot	69.58	71.25	89.69	35.61	68.41	71.56	94.63	27.56
Fatehgarh Sahib	64.71	66.96	81.36	34.31	66.06	69.47	86.60	29.96
Firozpur	67.76	74.78	90.98	26.22	61.56	61.79	83.86	28.54
Gurdaspur	57.43	67.36	78.26	18.52	65.34	69.44	91.54	24.51
Hoshiarpur	67.47	72.46	87.07	30.70	65.55	67.61	85.30	31.78
Jalandhar	68.73	74.64	86.56	32.27	70.56	68.54	93.85	37.63
Kapurthala	66.35	74.47	85.72	27.05	69.15	67.09	93.54	35.49
Ludhiana	60.08	61.97	77.14	30.53	68.69	75.04	82.58	35.03

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Mansa	54.92	57.15	75.83	22.91	66.12	66.67	83.34	36.68
Moga	70.16	75.49	94.77	28.46	65.16	71.53	87.53	25.01
Muktsar	70.37	67.52	96.11	36.68	52.19	51.93	74.18	22.28
Nawanshahr	66.30	67.71	83.95	35.66	67.68	73.95	91.26	26.03
Patiala	60.79	74.26	82.89	17.73	68.59	69.95	87.18	36.24
Rupnagar	65.97	70.16	81.98	33.67	57.38	64.59	78.53	19.75
Sangrur	62.63	73.41	68.46	34.38	61.67	74.19	80.86	19.98
SAS Nagar	64.93	71.34	78.26	32.95	66.45	69.32	82.75	34.87
Tarn Taran	60.66	75.08	85.49	15.83	64.97	72.02	74.59	35.79
Rajasthan								
Ajmer	52.29	49.98	63.53	36.46	52.54	43.61	76.87	32.80
Alwar	36.81	29.59	49.68	30.32	27.96	21.95	33.63	32.42
Banswara	51.56	39.55	93.10	23.59	34.45	28.12	40.28	38.93
Baran	49.21	48.48	62.14	29.05	42.62	37.93	57.95	26.79
Barmer	37.30	26.32	63.72	23.86	46.46	39.56	65.40	29.94
Bharatpur	30.17	24.45	35.80	33.26	48.53	34.39	74.74	39.61
Bhilwara	51.44	39.11	77.53	37.15	55.21	50.48	75.76	31.72
Bikaner	38.55	30.39	54.58	29.67	50.26	37.81	93.07	22.46
Bundi	50.55	45.84	64.51	35.56	37.76	33.19	52.20	23.49
Chittaurgarh	49.60	42.57	74.74	26.73	52.87	49.62	71.40	29.59

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Churu	37.03	26.05	55.60	32.59	46.85	45.00	61.61	26.44
Dausa	46.43	42.51	62.15	28.47	36.97	22.67	62.33	34.61
Dhaulpur	34.12	26.22	51.21	24.25	31.61	20.89	52.14	25.95
Dungarpur	56.19	43.29	91.42	32.70	47.96	37.47	73.45	31.10
Ganganagar	49.81	40.95	75.75	29.12	43.36	37.16	56.79	32.82
Hamumangarh	40.95	33.25	71.47	17.71	34.93	26.83	48.66	29.85
Jaipur	53.42	46.17	70.09	39.53	45.75	40.49	62.29	29.07
Jaisalmer	35.99	26.26	56.42	26.13	40.94	33.51	72.04	16.83
Jalor	43.48	38.52	64.73	22.34	34.95	24.55	56.80	25.55
Jhalawar	43.01	34.46	60.29	32.59	45.62	32.80	82.22	24.41
Jhunjhunun	53.01	44.50	75.11	34.97	36.63	25.11	63.44	24.35
Jodhpur	44.35	37.55	66.75	24.77	46.89	37.67	76.61	24.21
Karauli	40.05	36.55	54.27	24.01	47.13	41.67	60.38	34.85
Kota	61.59	56.59	80.83	39.26	45.28	39.79	70.13	21.33
Nagaur	47.59	39.88	67.30	31.66	54.98	41.22	91.28	32.41
Pali	47.86	44.63	68.84	23.61	39.77	30.11	57.45	32.22
Rajsamand	51.12	41.41	76.58	32.13	43.49	33.58	64.81	31.08
Sawai	38.01	31.75	45.22	38.69	47.35	38.20	74.68	26.38
Sikar	53.39	51.48	68.88	31.56	32.43	23.61	51.88	22.52
Sirohi	47.21	43.73	71.09	21.18	42.93	37.69	63.66	22.55

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Tonk	48.24	44.13	62.61	31.91	38.61	29.96	63.00	21.81
Udaipur	49.55	37.67	83.24	27.55	47.62	40.89	70.28	26.74
Sikkim								
Sikkim East	68.58	67.13	92.46	35.15	59.16	46.34	89.72	39.05
Sikkim North	64.06	54.53	92.60	38.93	67.79	64.48	91.61	36.63
Sikkim South	60.13	54.74	88.64	29.61	60.40	54.44	88.66	30.44
Sikkim West	59.49	47.39	89.46	38.61	64.08	54.19	92.59	39.39
Tamilnadu								
Ariyalur	81.76	91.42	94.05	44.52	76.48	85.13	92.56	36.65
Chennai	83.07	97.53	93.01	42.89	na	na	na	na
Coimbatore	75.74	94.42	88.62	30.40	73.53	81.23	85.05	40.10
Cuddalore	74.22	89.00	86.49	33.07	73.22	86.98	87.53	30.74
Dharmapuri	74.95	81.79	88.66	40.45	72.57	79.96	87.34	36.16
Dindigul	75.76	85.70	89.69	37.42	76.36	93.44	86.48	34.00
Erode	82.80	95.30	92.28	45.35	80.74	86.86	93.59	46.83
Kancheepuram	76.75	92.79	92.24	31.12	85.37	96.05	91.01	54.40
Kanniyakumari	78.56	93.22	90.10	37.29	74.05	83.09	88.69	35.67
Karur	80.59	89.94	92.06	44.82	73.10	88.24	92.11	25.90
Krishnagiri	77.37	81.80	86.45	51.72	79.71	87.18	85.22	54.12
Madurai	75.17	87.72	86.22	37.16	75.58	85.54	93.18	33.19

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Nagapattinam	76.57	93.18	86.97	35.01	77.85	88.75	89.49	39.87
Namakkal	78.95	90.14	90.43	41.27	77.65	94.56	91.07	32.13
Pudukottai	73.55	84.02	92.21	30.90	76.84	89.67	87.21	38.31
Ramanathpuram	76.34	87.20	89.66	37.52	74.77	85.69	86.75	36.95
Salem	81.11	90.43	87.39	52.05	77.94	90.70	90.78	36.73
Sivganga	75.31	88.97	89.63	33.07	73.68	91.42	91.97	24.96
Thanjavur	76.91	90.33	87.38	38.29	68.97	80.34	81.62	31.16
The Nilgiris	83.27	94.27	95.40	44.43	76.90	80.56	87.58	49.77
Theni	73.05	85.44	84.48	35.22	80.29	86.36	91.51	48.56
Thirunelveli	75.93	91.32	88.68	33.41	75.01	80.88	92.96	36.70
Thiruvallur	83.37	94.04	93.67	47.02	82.32	90.41	94.85	46.00
Thiruvarur	76.96	86.97	93.26	36.03	81.31	93.65	98.08	36.05
Thoothukudi	79.71	86.26	92.33	46.19	80.72	87.61	91.99	47.72
Tiruvannamalai	76.47	80.89	90.99	43.88	77.17	83.96	89.91	42.96
Trichy	75.30	88.65	88.80	34.08	74.11	84.68	91.47	31.69
Vellore	80.08	88.72	90.22	46.88	74.64	87.27	85.31	36.42
Viluppuram	75.31	82.36	93.35	36.12	77.84	94.82	94.32	29.70
Virudhunagar	74.02	84.35	85.86	37.74	76.03	80.58	90.68	42.66
Tripura								
Dhalai	39.76	38.64	46.85	28.68	44.72	32.85	65.01	38.46

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
North Tripura	42.78	47.33	45.28	29.20	52.97	43.86	75.34	35.64
South Tripura	45.56	33.94	65.97	38.05	41.50	45.41	42.56	31.17
West Tripura	53.17	46.84	73.12	33.50	39.04	37.78	45.55	28.99
Uttar Pradesh								
Agra	30.45	38.01	42.18	8.11	44.37	58.72	53.57	13.89
Aligarh	33.19	45.86	46.21	6.83	30.03	23.36	42.63	23.76
Allahabad	33.31	33.15	42.09	19.17	33.87	26.84	46.26	28.09
Ambedaker Nagar	34.22	30.53	61.92	10.80	38.43	35.27	56.74	18.27
Auraiya	31.40	28.93	51.87	11.41	36.90	30.16	58.87	19.36
Azamgarh	34.58	36.53	52.34	11.15	27.93	24.16	42.05	14.67
Baghpat	43.29	62.19	47.17	14.65	15.58	12.78	31.59	4.49
Bahraich	16.46	13.65	31.81	5.30	29.03	37.42	34.03	10.44
Ballia	34.08	35.09	56.31	9.46	17.56	12.19	35.27	7.87
Balrampur	16.99	16.10	28.83	5.41	36.66	43.73	53.17	9.47
Banda	27.61	24.60	37.53	17.42	31.89	27.68	59.86	9.66
Barabanki	30.74	24.85	43.63	22.12	40.64	40.26	64.43	13.41
Bareilly	30.49	34.71	43.52	9.44	50.28	56.03	72.16	15.79
Basti	33.54	27.78	63.22	11.49	33.50	58.91	48.70	3.27
Bijnor	43.43	59.13	51.42	13.68	29.96	27.31	39.11	19.61
Budaun	17.42	15.52	32.06	5.30	28.20	23.04	40.91	18.70

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Bulandshahar	37.37	58.28	47.09	7.30	24.74	21.73	35.89	13.70
Chandauli	32.79	27.34	46.30	22.18	20.27	20.50	29.47	7.86
Chitrakoot	28.75	23.77	41.53	18.76	31.73	20.38	57.82	21.90
Deoria	49.33	54.84	71.44	15.62	39.44	42.60	54.21	14.89
Etah	23.73	39.31	27.27	5.00	36.59	56.36	46.23	7.02
Etawah	31.83	30.43	52.04	10.85	43.34	38.23	64.56	22.26
Faizabad	35.43	33.85	55.15	13.61	36.87	35.51	53.61	16.12
Farrukhabad	21.36	17.01	37.38	9.62	33.65	27.99	52.49	17.87
Fatehpur	28.00	25.89	44.36	11.16	23.70	26.25	33.06	8.10
Firozabad	30.75	39.44	46.27	6.28	16.57	13.81	30.88	5.65
Gautam Budh Nagar	37.28	43.92	51.42	11.55	16.75	15.89	28.92	4.98
Ghaziabad	38.32	49.34	47.23	12.55	33.42	33.82	56.09	9.08
Ghazipur	33.73	28.68	52.66	17.06	23.51	16.79	49.98	8.51
Gonda	22.22	20.61	35.61	8.55	26.41	28.59	35.32	10.62
Gorakhpur	46.00	40.96	66.93	24.69	37.48	28.39	55.97	27.94
Hamirpur	38.54	32.19	59.36	21.04	25.44	26.91	45.41	5.32
Hardoi	27.83	26.23	39.42	13.86	27.45	24.71	43.86	11.27
Hathras	33.14	36.33	46.52	11.71	29.56	33.35	42.22	9.12
Jalaun	31.61	25.21	48.39	19.60	28.58	20.58	45.89	20.24
Jaunpur	30.73	28.58	54.28	9.29	17.33	15.28	30.40	5.96

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Jhansi	40.95	37.27	58.09	22.15	30.73	28.18	54.27	9.43
Jyotiba Phule Nagar	25.53	26.48	44.89	5.99	35.69	36.53	54.05	12.13
Kannauj	29.91	31.90	44.39	9.87	21.37	19.58	34.57	8.16
Kanpur	45.72	40.47	67.05	24.40	32.50	34.81	45.69	11.84
Kanpur	32.22	20.83	58.98	21.56	26.15	23.13	38.23	13.97
Kaushambi	25.08	28.42	34.66	8.50	38.24	44.69	51.77	12.31
Kheri	22.29	18.43	30.28	16.89	34.29	32.82	54.75	12.10
Kushinagar	38.05	44.82	51.54	12.31	33.34	39.83	44.99	10.25
Lalitpur	35.51	29.00	48.30	27.65	42.26	38.20	59.18	23.74
Lucknow	47.41	49.25	65.21	20.05	37.41	42.93	54.30	10.61
Maharajganj	37.59	36.76	54.23	16.40	39.26	32.26	64.29	19.05
Mahoba	39.17	38.15	56.20	17.50	29.71	29.65	45.71	10.36
Mainpuri	27.94	22.78	47.57	12.71	32.31	25.79	46.28	23.43
Mathura	31.34	42.12	36.76	10.43	32.98	26.48	63.09	11.56
Mau	36.16	36.02	56.46	12.47	28.26	23.03	56.70	8.50
Meerut	41.03	50.72	54.80	12.23	43.29	61.17	46.52	15.32
Mirzapur	27.44	30.71	36.94	10.20	26.59	20.09	51.15	10.71
Moradabad	30.56	32.52	45.15	10.25	35.01	29.67	64.84	11.62
Muzaffarnagar	34.31	59.61	49.65	3.69	29.91	42.03	46.13	4.41
Pilibhit	24.53	20.69	42.30	9.96	22.09	38.21	23.78	4.71

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Pratapgarh	39.70	33.24	64.66	18.82	22.00	17.70	29.93	17.76
Rae Bareli	37.70	29.21	55.38	27.65	34.34	44.74	39.21	12.82
Rampur	33.52	41.48	45.65	9.51	30.39	25.84	52.24	12.02
Saharanpur	39.14	44.41	54.90	12.76	27.83	32.63	42.16	6.75
Sant Kabir Nagar	28.83	23.45	57.05	9.16	24.80	20.30	42.63	10.79
Sant Ravidas Nagar	27.80	24.73	41.04	14.44	33.54	30.85	59.30	10.18
Shahjahanpur	18.62	14.54	35.94	6.94	30.51	25.71	53.16	11.94
Shrawasti	17.27	15.39	30.14	5.97	37.68	35.77	58.96	14.28
Siddharthnagar	23.67	17.16	49.95	8.53	29.44	29.04	44.32	11.14
Sitapur	21.61	21.91	32.26	7.94	19.61	14.34	36.57	9.25
Sonbhadra	32.66	29.54	50.16	14.80	38.79	37.34	66.13	11.49
Sultanpur	34.23	31.99	59.82	10.50	26.73	20.57	46.97	12.85
Unnao	28.69	22.79	52.30	11.79	27.90	33.58	47.68	4.71
Varanasi	42.63	43.50	66.52	13.89	32.06	29.19	47.61	15.32
Uttarakhand								
Almora	49.68	28.13	84.59	54.56	49.88	30.75	81.48	49.83
Bageshwar	36.59	20.83	69.31	30.70	45.87	29.03	72.83	46.05
Chamoli	57.68	41.66	82.68	53.24	36.44	20.55	69.30	31.28
Champawat	43.52	25.39	72.82	46.42	49.22	28.78	83.65	50.92
Dehradun	61.50	54.15	80.29	44.00	53.92	39.80	77.14	47.65

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Garhwal	49.59	33.76	79.56	40.24	48.60	32.12	79.01	41.31
Haridwar	46.79	38.26	67.06	31.99	42.91	21.61	76.91	56.45
Nainital	49.75	35.32	74.09	43.65	45.88	26.35	82.85	42.74
Pithoragarh	50.89	32.18	82.14	48.69	43.80	33.62	66.47	30.38
Rudraprayag	49.81	29.50	83.81	50.51	55.91	38.29	82.34	55.46
Tehri Garhwal	47.28	28.02	83.61	42.45	41.75	23.72	70.58	47.03
Udham Singh Nagar	54.86	38.82	82.30	47.70	51.82	33.19	80.66	53.04
Uttarkashi	44.88	23.86	77.40	55.68	48.40	26.12	85.04	56.33
West Bengal								
Bankura	66.99	58.47	94.86	40.26	61.31	61.97	83.80	27.70
Barddhaman	61.97	60.84	79.23	35.83	57.56	47.52	86.95	33.66
Birbhum	57.64	49.48	80.00	37.83	60.06	52.45	90.22	30.96
Dakshin Dinajpur	62.63	53.04	92.49	36.59	67.13	64.30	91.27	35.13
Darjiling	69.08	70.37	89.31	35.55	66.44	55.37	96.10	42.26
Haora	64.86	74.14	81.64	26.95	61.03	49.29	85.65	45.18
Hugli	69.25	78.17	95.84	23.58	68.13	65.22	94.12	34.33
Jalpaiguri	61.82	57.11	89.37	30.80	63.62	58.96	84.01	38.83
Koch Behar	58.38	49.02	87.77	33.35	58.05	48.65	80.63	40.23
Kolkata	69.14	80.25	83.54	30.55	na	na	na	na
Maldah	56.03	47.72	79.41	35.65	64.79	69.90	86.84	26.11

State District	Total population				Rural population			
	Health system performance index	Performance index in			Health system performance index	Performance index in		
		Maternal health	Child immunisation	Child health		Maternal health	Child immunisation	Child health
Murshidabad	56.82	52.23	77.35	33.14	70.78	74.59	95.93	29.42
Nadia	69.83	68.77	93.60	35.76	55.96	47.03	79.35	36.60
North 24 Pargnas	65.60	69.95	89.12	26.83	56.88	51.11	78.72	33.39
Pachim Medinipur	61.20	50.66	91.77	36.42	64.70	55.89	91.91	39.33
Purab Medinipur	64.65	56.44	92.06	38.32	52.24	52.69	67.45	27.28
Puruliya	61.63	51.12	85.22	44.35	61.55	50.76	91.75	37.29
South 24 Parganas	51.97	48.40	83.09	19.93	51.34	47.66	82.56	19.22
Uttar Dinajpur	52.86	54.72	68.83	25.73	62.51	51.79	92.45	38.18

Source: Author's calculations